# PRAFT

# Petroleum Refining Process Waste Listing Determination

# Additional Groundwater Pathway Risk Analyses

Supplemental Background Document

US Environmental Protection Agency Office of Solid Waste Washington, DC

1998

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#### 1.0 INTRODUCTION

#### 1.1 GENERAL BACKGROUND

This document describes groundwater pathway analyses performed to support the petroleum refining listing determination. These analyses supplement the analyses carried out earlier as part of the EPA's proposal for the petroleum refining listing determination (60 FR 57747, November 20, 1995; USEPA, 1995b) and EPA's Notice of Data Availability (NODA, 62 FR 16747, April 8, 1997; USEPA, 1997a). The analyses were designed to determine the potential exposure, via the groundwater pathway, to human receptors from petroleum refining wastes, being managed and/or disposed in land management units. The exposure is expressed in terms of the contaminant concentration at a groundwater extraction well located downgradient from the waste-management unit.

The contaminant concentrations were obtained using the EPA's Composite Model for Leachate Migration with Transformation Products (EPACMTP) (USEPA, 1996b, c, d; USEPA, 1997b). EPACMTP simulates the subsurface fate and transport of waste constituents leaching from land disposal units. Wastestreams and waste constituents of potential concern are identified by comparing the model predicted exposure concentrations to health-based numbers (HBNs) for both carcinogens and non-carcinogens.

In the current modeling analyses, revisions have been made to several modeling assumptions such as landfill active lifetime and offsite landfill area distributions. The revisions were made based on EPA's reevaluation of the petroleum refining data in response to public comment on the NODA.

#### 1.2 ADDITIONAL ANALYSES

A number of public comments were received challenging the modeling assumptions used for the groundwater pathway analyses conducted in support of the Petroleum Refining Waste NODA. The Agency disagreed with many of the comments and has addressed those comments individually in the comment-response document (USEPA, 1998). There are however several issues which EPA agreed required revisions to the groundwater pathway analysis. Those issues were as follows:

- Active Offsite Landfill Life
- Median Offsite Landfill Area
- Appropriate Database for Landfill Area Distributions
- Sensitivity to Exposure Duration
- Dispersivity Values used in Two High-End Parameter Analysis
- Off-spec Product and Fines Volume Distribution for Monte Carlo Analysis

In addition to the changes noted above, the Agency has also corrected the health-based number (HBN) for benz(a)anthracene (BaA). The current analysis uses the correct value of 4.0 x 10<sup>-4</sup>

mg/l (corresponding to a risk level of 1E-6) rather than the value of  $2.0 \times 10^{-5}$  mg/l which was used in the previous analyses (U.S.EPA, 1995b; 1997a).

#### 1.3 WASTESTREAMS AND MANAGEMENT SCENARIOS

The 1994 consent decree mandating investigation of the Petroleum Refining Industry indentified 14 specific residuals or wastestreams for which the Agency must make a listing determination (listing wastestreams) and 15 wastestreams for which the Agency must conduct an industry study (study wastestreams). A complete description of listing and study wastestreams is presented in the appropriate background documents (USEPA, 1995a and USEPA, 1996a). Of the 12 listing wastestreams evaluated in the 1997 analysis, four showed very low groundwater risk and were therefore not evaluated in the current analysis. The eight wastestreams evaluated in the current (1998) analysis are listed in Table 1.1. Both single-wastestream disposal (baseline) and multi-wastestream disposal (codisposal) scenarios have been reevaluated; however, only offsite landfills have been reevaluated because the Agency does not believe any changes are required in the onsite landfill assumptions (see the comment and response document; USEPA, 1998). Table 1.1 presents a summary of the modeled listing wastestreams and landfill modeling scenarios. The study wastestreams (Table 1.2) were included only in the codisposal scenario.

Table 1.1 Petroleum Refining Listing Wastestreams and Landfill Scenarios.

|                                     |                       | Landfill             | Scenarios     |             |
|-------------------------------------|-----------------------|----------------------|---------------|-------------|
| Wastestream                         | Detern<br>Sensitivity | ninistic<br>Analysis | Monte Car     | lo Analysis |
|                                     | On-site               | Off-site             | On-site       | Off-site    |
| Crude Oil Tank Sediment             |                       | . <b>x</b>           | ,             | ~ <b>X</b>  |
| CSO Sediment                        |                       | x                    |               | x           |
| Contingent CSO Sediment             |                       | x                    |               | x           |
| Unleaded Gasoline Tank Sediment     |                       | x                    |               | х           |
| Off-spec Product Fines (Coke Fines) |                       | х                    | - '- <u>-</u> | х           |
| HF Alkylation Sludge                |                       | х                    |               | х           |
| Hydrotreating Catalyst              |                       | х                    |               | х           |
| Hydrorefining Catalyst              |                       | . х                  |               | х           |
| Codisposal <sup>1</sup>             |                       | x <sup>2</sup>       | •             | х           |

<sup>1.</sup> The Codisposal landfill scenario consisted of all wastestreams listed above except hydrotreating and hydrorefining catalysts plus study wastestreams listed in Table 1.2.

<sup>2.</sup> A two high-end parameter analysis was performed for codisposal based on the results of a 1995 two high-end parameter sensitivity analysis for crude tank sediment. Downgradient well distance (X-well) and landfill area were selected as the two high-end parameters.

Table 1.2 Petroleum Refining Study Wastestreams Included in the Codisposal Analysis.

|       | Wastestream                         | Codis   | posal    |
|-------|-------------------------------------|---------|----------|
|       |                                     | On-site | Off-site |
| I.    | Desalting Sludge                    |         | х        |
| II.   | Extraction Clay                     |         | x        |
| III.  | HF Treating Clay                    |         | х        |
| IV.   | Isomerization Clay                  |         | х        |
| V     | Phosphoric Acid Catalyst            |         | х        |
| VI.   | Process Sludge-Residual Upgrade     |         | х        |
| VII.  | Off-spec Sulfur                     |         | x        |
| VIII. | Treating Clay from Clay-Filtering   |         | х        |
| IX.   | Hydrocracking Catalyst <sup>1</sup> |         | х        |
| Χ.    | Residual Oil Tank Sludge            |         | х        |

<sup>1.</sup> Codisposal analysis was performed both with and without hydrocracking catalyst

#### 1.4 METHODOLOGY

#### 1.4.1 Approach

The modeling approach for both the deterministic sensitivity analyses and the Monte Carlo analysis are identical to the approach described in Section 2 of the Supplemental Background Document for the Groundwater Pathway Risk Analysis (USEPA, 1997a) with the following exceptions:

- Waste volumes were based on an active life of 30 years rather than 20 years (see Section 2.1).
- Areas were selected from a distribution of municipal landfill areas rather than industrial landfills (see Section 2.3).

#### 1.4.2 Input Data

The data sources are described in the 1997 Supplemental Background Document for Groundwater Pathway Analysis (USEPA, 1997a; Section 2.2 and Appendices A-D). All of the input data for the current analyses are identical to the data described in that document with the following exceptions:

- The waste volumes are based on 30 year rather than 20 year active lives (see Section 2.1) and are therefore 1.5 times greater and,
- The distribution of Off-spec Product and Fines waste volumes has been updated (see section 4.1).

#### 2.0 REVISED TWO PARAMETER SENSITIVITY ANALYSES

Revised sensitivity analyses have been conducted for offsite landfill disposal of petroleum refining wastes. The following issues were addressed in the revised sensitivity analyses: (1) active landfill life, (2) use of correct median industrial landfill area, (3) use of municipal versus industrial landfill areas, and (4) use of correct dispersivity values.

#### 2.1 ACTIVE LANDFILL LIFE

In both the Proposal analyses and the NODA analyses an active landfill life of 20 years was assumed for both onsite and offsite landfills (USEPA, 1995b and 1997a). Review of landfill lifetime data from the RCRA §3007 Survey suggests that 20 years is reasonable for onsite landfills (see comment and response document; USEPA, 1998). However, an OSW survey of municipal landfills (USEPA, 1988) suggests that 30 years may be more representative for offsite landfills (USEPA, 1998). Consequently, revised analyses were conducted for both 20 and 30 year active lives to evaluate the impact of increasing the active life assumption.

#### 2.2 REVISED MEDIAN LANDFILL AREA

One commenter correctly noted that the median landfill area used in the offsite landfill two parameter sensitivity analysis seemed unreasonably small, 2,020 m<sup>2</sup> (see comment and response document; US EPA, 1998). In fact, the correct median area should have been 20,200 m<sup>2</sup>. The updated median landfill area was used in both the 20 and 30 year active life sensitivity analyses.

#### 2.3 MUNICIPAL LANDFILL AREA DISTRIBUTION

In the previous petroleum refining waste analyses, offsite landfills areas were assumed to be represented by the Industrial Subtitle D landfill area distribution. However, one commenter suggested that the Industrial Subtitle D Landfill survey consisted of onsite industrial landfills not offsite units (see comment and response document; USEPA, 1998). Therefore, the Agency believes the municipal landfill area distribution may be more appropriate (USEPA, 1988). Consequently, revised sensitivity analyses were conducted using both municipal and industrial landfill area distributions. A comparison of municipal and industrial landfill areas is shown in Table 2.1.

Table 2.1 Landfill Area Distributions

|            | Area       | (m²)      |
|------------|------------|-----------|
| Percentile | Industrial | Municipal |
| 10th       | 809        | 8,094     |
| 50th       | 20,200     | 60,705    |
| 90th       | 162,000    | 420,888   |
| Maximum    | 3,120,000  | 9,348,570 |

#### 2.4 REVISED DISPERSIVITY VALUES

One commenter correctly noted that a single dispersivity value was used for all two high-end parameter analyses regardless of well location. To correct this inconsistency, dispersivity values were adjusted for the distance between the well location and the waste management unit based on the Gelhar distribution (USEPA, 1997b) for each simulation. In addition, a sensitivity analysis was performed for crude oil tank sediment to compare well concentrations using the single fixed dispersivity from the previous analyses with well concentrations using the distance-adjusted dispersivity. The effect of the change in dispersivity was minimal.

#### 2.5 SUMMARY OF RESULTS

A summary of the revised two high-end parameter sensitivity analyses is shown in Tables 2.2 and 2.3 for the 20 year and 30 year analyses respectively. With the exception of the hydrotreating catalyst-municipal area-arsenic scenario, in all cases, Xwell (downgradient well distance) was one of the two most sensitive parameters for each wastestream. Other sensitive parameters included infiltration, waste volume, TCLP concentration, and waste concentration.

Table 2.2 Summary of Two High-End Parameter Sensitivity Analysis for 20 Year Active Landfill Life

|                                |                               | Two Parameters      | Area  | Wst Vol | 4CI D  | WetConc | 2/30   | Wet Don | 194  | ,   | , , , , |     | Maximum   |
|--------------------------------|-------------------------------|---------------------|-------|---------|--------|---------|--------|---------|------|-----|---------|-----|-----------|
| Waste Stream                   | Constituent                   | at High End         | (m2)  | (m3)    | (mg/L) | (mg/kg) | (L/kg) | (g/cm3) |      | (E) | (E)     | (m) | Well Conc |
| CSO-Industrial                 | Benzene                       | Infil & Xwell       | 20200 | 2635.71 | 0.059  | 1.2     | 20.3   | 4.      | 0.46 | 200 | 60 76   | 6.5 | 1 52E-02  |
| CSO-Municipal                  | Benzene                       | Xwell & Wst Vol     | 60705 | 44900   | 0.059  | 1.2     | 20.3   | 4       | 0.17 | 165 | 93 70   | 5.0 | 2 15E 02  |
| Cont-CSO-Industrial            | Benzene                       | Infil & Xwell       | 20200 | 2500    | 0.059  | 1.2     | 20.3   | 4       | 0.46 | 102 | 60.76   |     | 1 50F-02  |
| Cont-CSO-Municipal             | Benzene                       | Xwell & Wst Vol     | 60705 | 44900   | 0.059  | 1.2     | 20.3   | 4       | 0.17 | 102 | 93 79   | 6.5 | 2 15E-02  |
| COTS-Industrial                | Benzene                       | Infil & Xwell       | 20200 | 457.24  | 0.679  | 58.72   | 86.5   | 1.52    | 0.46 | 102 | 92 09   |     | 1 57F-01  |
| COTS-Municipal                 | Benzene                       | Xwell & Wst Vol     | 60705 | 8315.8  | 0.679  | 58.72   | 86.5   | 1.52    | 0.17 | 102 | 93 79   |     | 2 38F-01  |
| Hydrotreating-Industrial       | Benzene                       | Wst. Conc& X-Well   | 20200 | 476     | 7.9    | 200     | 63.3   | 0.84    | 0.17 | 102 | 60.76   | 6.5 | 6.02E-01  |
| Hydrotreating-Municipal        | Benzene                       | 1.00                | 60705 | 476     | 7.9    | 200     | 63.3   | 0.84    | 0.17 | 102 | 93.79   |     | 5 73E-01  |
| Hydrotreating-Industrial       | Arsenic                       |                     | 20200 | 476     | 1.1    | 1600    | 1454.5 | 0.84    | 0.17 | 102 | 60.76   |     | 2.24E-02  |
| Hydrotreating-Municipal        |                               | Wst. Vol & Wst Conc | 60705 | 1842.9  | 1.1    | 1600    | 1454.5 | 0.84    | 0.17 | 430 | 117.75  | 6.5 | 1.66E-02  |
| Off-Spec Prod. and Fines Ind.  | Benz(a)anthracene             | Xwell & Wst Vol     | 20200 | 10460.3 | 0.013  | 12      | 923.1  | 1.26    | 0.17 | 102 | 60.76   | 6.5 | 6.39E-04  |
| Off-Spec Prod. and Fines Mun.  | Benz(a)anthracene   Xwell & W | Xwell & Wst Vol     | 60705 | 10460.3 | 0.013  | 12      | 923.1  | 1.26    | 0.17 | 102 | 93.79   | 6.5 | 6.96E-04  |
| Off-Spec Prod. and Fines Ind.  | Benz(a)anthracene X-well & T  | X-well & TCLP       | 20200 | 1439.68 | 0.013  | 12      | 923.1  | 1.26    | 0.17 | 102 | 92.09   | 6.5 | 2.11E-04  |
| Off-Spec Prod. and Fines Mun.  | Benz(a)anthracene X-well & 1  | X-well & TCLP       | 60705 | 1439.68 | 0.013  | 12      | 923.1  | 1.26    | 0.17 | 102 | 93.79   | 6.5 | 1 39F-04  |
| Hydroretining-Industrial       |                               | Infii & Xwell       | 20200 | 1476    | 1.49   | 43.73   | 29.3   | 1.2     | 0.46 | 102 | 60.76   | 6.5 | 3.19E-01  |
| Hydrorefining-Municipal        | 6                             | Xwell & Wst Vol     | 60705 | 8333.3  | 1.49   | 43.73   | 29.3   | 1.2     | 0.17 | 102 | 93.79   | 6.5 | 4.20E-01  |
| Hydrorefining-Industrial       |                               | Xwell & Wst Vol     | 20200 | 8333.3  | 13.71  | 493.3   | 36.0   | 1.2     | 0.17 | 102 | 92.09   | 6.5 | 1 77F-01  |
| Hydrorefining-Municipal        |                               | Xwell & Wst Vol     | 90209 | 8333.3  | 13.71  | 493.3   | 36.0   | 1.2     | 0.17 | ╀   | 93.79   | 6.5 | 1 18F-01  |
| Unl. Gas. Tank SedIndustrial   |                               | Xwell & Wst Vol     | 20200 | 1038.57 | 0.75   | 51.9    | 69.2   | 1.4     | 0.17 | ╀   | 60.76   | 6.5 | 9.94E-02  |
| Uni. Gas. Tank SedMunicipal    |                               | Xwell & Wst Vol     | 60705 | 1038.57 | 0.75   | 51.9    | 69.2   | 4.1     | 0.17 | 102 | 93.79   | 6.5 | 1.41E-01  |
| - 1                            |                               | Infil & Xwell       | 20200 | 24542.4 | 0.076  | 4.3     | 56.6   | 1.18    | 0.46 | 102 | 60.76   | 6.5 | 3.73E-02  |
| Hr Alkylation Sludge-Municipal | Benzene                       | TCLP & Xwell        | 60705 | 24542.4 | 0.18   | 4.3     | 23.9   | 1.18    | 0.17 | 102 | 93.79   | 6.5 | 6.06E-02  |
| _                              |                               |                     |       |         |        |         |        |         |      |     |         |     |           |

1. The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value

<sup>2.</sup> The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value

Table 2.3 Summary of Two High-End Parameter Sensitivity Analysis for 30 Year Active Landfill Life

|  | ,                            | -                   |        |          |        |          |         |          |        |        |         |        | Maximum     |
|--|------------------------------|---------------------|--------|----------|--------|----------|---------|----------|--------|--------|---------|--------|-------------|
|  |                              | Two Parameters      | Area   | Wst. Vol | TCLP   | Wst Conc | CW/CI   | Wst. Den | Infil  | X-well | Y- Well | Z-Well | 9-year Avg. |
| Waste Stream                             | Constituent                  | at High End         | (m2)   | (m3)     | (mg/L) | (mg/kg)  | (L/kg)  | (g/cm3)  | (m/yr) | Ē      | Ê       | Ê      | Well Conc.  |
| CSO-Industrial                           | Benzene                      | Infil & Xwell       | 20200  | 3953.57  | 0.059  | 1.2      | 20.34   | 1.4      | 0.46   | 102    | 60.76   | 6.5    | 1.82E-02    |
| CSO-Municipal                            | Benzene                      | Xwell & Wst Vol     | 60705  | 67350    | 0.059  | 1.2      | 20.34   | 4.1      | 0.17   | 102    | 93.79   | 6.5    | 2.21E-02    |
| Cont-CSO-Industrial                      | Benzene                      | X-Well & Infil      | 20200  | 3750     | 0.059  | 1.2      | 20.34   | 4.       | 0.46   | 102    | 92.09   | 6.5    | 1.78E-02    |
| Cont-CSO-Municipal                       | Benzene                      | Wst. Vol & X-Well   | 60705  | 67350    | 0.059  | 1.2      | 20.34   | 1.4      | 0.17   | 102    | 93.79   | 6.5    | 2.21E-02    |
| COTS-Industrial                          | Benzene                      | Infil & Xwell       | 20200  | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 102    | 60.76   | 6.5    | 1.91E-01    |
| COTS-Municipal                           | Benzene                      | Xwell & Wst Vol     | 60705  | 12437.7  | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 102    | 93.79   | 6.5    | 2.39E-01    |
| Hydrotreating-Industrial                 | Benzene                      | Wst. Conc. & X-Well | 20200  | 714      | 7.9    | 200      | 63.29   | 0.84     | 0.17   | 102    | 60.76   | 6.5    | 7 41E-01    |
| Hydrotreating-Municipal                  | Benzene                      | Wst. Conc. & X-Well | 60705  | 714      | 7.9    | 200      | 63.29   | 0.84     | 0.17   | 102    | 93.79   | 6.5    | 7.97E-01    |
| Hydrotreating-Industrial                 | Arsenic                      | Wst. Conc. & X-Well | 20200  | 714      | 1.1    | 1600     | 1454.55 | 0.84     | 0.17   | 102    | 92.09   | 6.5    | 3.23E-02    |
|  | Arsenic                      | Wst. Vol & Wst Conc | 60705  | 2763.9   | 1.1    | 1600     | 1454.55 | 0.84     | 0.17   | 430    | 117.75  | 6.5    | 2.41E-02    |
| Off-Spec Prod. and Fines Ind.            | Benz(a)anthracene Wst. Vol ( | Wst. Vol & X-Well   | 20200  | 15690.45 | 0.013  | 12       | 923.08  | 1.26     | 0.17   | 102    | 92.09   | 6.5    | 7.02E-04    |
|  | Benz(a)anthracene            | Wst. Vol & X-Well   | 60705  | 15690.45 | 0.013  | 12       | 923.08  | 1.26     | 0.17   | 102    | 93.79   | 6.5    | 8.56E-04    |
| Off-Spec Prod. and Fines Ind.            | Benz(a)anthracene X-well &   | X-well & TCLP       | 20200  | 2159.52  | 0.013  | 12       | 923.08  | 1.26     | 0.17   | 102    | 92.09   | 6.5    | 2.91E-04    |
| Off-Spec Prod. and Fines Munt.           |                              | X-well & TCLP       | 60705  | 2159.52  | 0.013  | 12       | 923.08  | 1.26     | 0.17   | 102    | 93.79   | 6.5    | 2.03E-04    |
| Hydrorefining-Industrial                 | Benzene                      | Infil & Xwell       | 20200  | 2214     | 1.49   | 43.73    | 29.35   | 1.2      | 0.46   | 102    | 92.09   | 6.5    | 3.93E-01    |
| Hydrorefining-Municipal                  | Benzene                      | Xwell & Wst Vol     | 60705  | 12500    | 1.49   | 43.73    | 29.35   | 1.2      | 0.17   | 102    | 93.79   | 6.5    | 4.59E-01    |
| Hydrorefining-Industrial                 | Arsenic                      | Xwell & Wst Vol     | 20200  | 12500    | 13.71  | 493.3    | 35.98   | 1.2      | 0.17   | 102    | 92.09   | 6.5    | 2.61E-01    |
| •  | Arsenic                      | Xwell & Wst Vol     | 60705  | 12500    | 13.71  | 493.3    | 35.98   | 1.2      | 0.17   | 102    | 93.79   | 6.5    | 1.77E-01    |
| - 1                                      | Benzene                      | Xwell & Wst Vol     | 20200  | 1557.85  | 0.75   | 51.9     | 69.20   | 4.1      | 0.17   | 102    | 92.09   | 6.5    | 1.08E-01    |
| Unl. Gas. Tank SedMunicipal              |                              | Xwell & Wst Vol     | 60705  | 1557.85  | 0.75   | 51.9     | 69.20   | 1.4      | 0.17   | 102    | 93.79   | 6.5    | 1.70E-01    |
| HF Alkylation Sludge-Industrial Benzene  | Benzene                      | Area & Xwell        | 162000 | 36813.6  | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 102    | 142.35  | 6.5    | 3.92E-02    |
| HF Alkylation Sludge-Municipal   Benzene | Benzene                      | TCLP & xwell        | 60705  | 36813.6  | 0.18   | 4.3      | 23.89   | 1.18     | 0.17   | 102    | 93.79   | 6.5    | 6.36E-02    |
|  |                              |                     |        |          |        |          |         |          |        |        |         |        |             |

The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value
 The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value

#### 3.0 TWO PARAMETER SENSITIVITY TO EXPOSURE DURATION

One commenter noted that exposure duration was included in the nongroundwater pathway sensitivity analysis, while a fixed exposure duration of 9 years was assumed for the groundwater pathway analysis (see comment and response document; USEPA, 1998). To address this comment, two parameter sensitivity analyses including exposure duration as a parameter were conducted for three wastestreams: HF alkylation sludge, hydrorefining catalyst, and unleaded gasoline tank sediment. Results of the analyses showed that exposure duration was never a sensitive parameter, and inclusion of exposure duration in the sensitivity analyses had no impact on selection of the two high-end parameters and consequently had no impact on the two high-end parameter analysis.

The results of the two parameter sensitivity analyses including exposure duration as a sensitive parameter are presented in Appendix B, Tables B.1 through B.8.

#### 4.0 REVISED MONTE CARLO ANALYSES

Revised Monte Carlo Analyses of all wastestreams showing risk levels above 1.0 x 10<sup>-6</sup> in the 1997 NODA analysis have been performed for offsite disposal. The revised analyses use the same Monte Carlo Approach discussed in the March 1997 Supplemental Background Document Groundwater Pathway Risk Analysis (U.S.EPA, 1997a) with several fundamental changes in modeling assumptions and data used. The changes were made to address the major comments discussed in Section 2, specifically landfill active life and use of municipal area distributions.

#### 4.1 OFF- SPEC PRODUCT AND FINES VOLUME DISTRIBUTION

In the NODA comments it was noted that there seemed to be a discrepancy between the Offspec Product and Fines waste volume distribution used for the Monte Carlo analysis and that used for the two high-end parameter analysis. That discrepancy was investigated and it was determined that a quantity of Off-spec Product and Fines waste sold as product was inadvertently listed as a quantity sent to an offsite landfill. That incorrect listing was identified and removed from the offsite landfill Off-spec Product and Fines waste quantity distribution. The updated volume distribution was used in the current Monte Carlo analysis and is listed in Table 4.1. Results of the Monte Carlo analysis are discussed in Section 5.

Table 4.1 Off-Spec Product and Fines Volume Distribution

| Facility I.D. | 1992 Waste Quantity<br>(MT/year) <sup>1</sup> | 30 Year Waste Volume (m³) <sup>2</sup> |
|---------------|---|--|
| 8             | 12  | 316.5                                  |
| 14            | 535   | 14,079                                 |
| 15            | 10  | 262.5                                  |
| 25            | 91  | 2,386.5                                |
| 35            | 548   | 14,421                                 |
| 67            | 659   | 17,341.5                               |

<sup>1.</sup> Reported in RCRA §3007 Survey Responses

# 4.2 MONTE CARLO ANALYSES WITH 30 YEAR ACTIVE LIFE AND MUNICIPAL LANDFILL AREA DISTRIBUTIONS

Monte Carlo analyses were performed assuming 30 year active landfill lives and municipal landfill area distributions. In addition, to better assess the impact of those changes in model assumptions, analyses were performed for select wastestreams (HF alkylation sludge and

<sup>2. 30</sup> year waste volume = 1992 waste quantity (MT/year)/waste density (MT/m³) \* 30 years

hydrorefining catalyst) with 20 year active landfill lives and municipal area distributions and 30 year active lives and industrial area distributions. Those results are presented in Table 5.10.

The municipal landfill area distribution used for the Monte Carlo analysis is shown in Table 4.2

Table 4.2 Municipal Landfill Area Distribution

| Area (m²) | Cumulative Probability |
|-----------|------------------------|
| 4,000     | 0.000                  |
| 8,094     | 0.100                  |
| 20,200    | 0.250                  |
| 60,705    | 0.500                  |
| 194,000   | 0.750                  |
| 420,888   | 0.900                  |
| 9,348,570 | 1.000                  |

#### 5.0 RESULTS OF REVISED 1998 ANALYSES

A summary of risks for both the two high-end parameter analysis and the Monte Carlo analysis is shown in Table 5.1. High-end risks for industrial versus municipal landfill area assumptions are shown in Tables 5.2 and 5.3. Table 5.2 compares industrial landfill areas versus municipal landfill areas for a 20 year active life and Table 5.3 compares industrial landfill areas versus municipal landfill areas for a 30 year active life. Tables 5.4 and 5.5 compare municipal and industrial central tendency risks for 20 and 30 year landfill active lives respectively.

#### 5.1 DETERMINISTIC RESULTS

Details of the two parameter sensitivity analyses are presented in Appendix A. Tables A.1 through A.32 provide results for the 20 year active lifetime and Tables A.33 through A.64 provide results for the 30 year active lifetime. Dilution attenuation factors (DAF's) for both central tendency and high-end results are presented in Appendix C (Tables C.1 through C.8). DAF's are defined as the source leachate concentration, C(0), divided by the receptor well concentration, Cw.

Details of the 30 year sensitivity analyses including exposure duration as a sensitive parameter are presented in Appendix B (Tables B.1 through B.8). Comparison of those sensitivity analyses with those presented in Tables A.51, A.53, A.55, A.57, A.59, A.61, A.63 and A.64, demonstrates that inclusion of exposure duration as a sensitive parameter does not impact the selection of the two high-end parameters.

#### 5.2 MONTE CARLO RESULTS

The Monte Carlo results are presented in Table 5.6 through 5.10. Results are presented in terms of total risk and DAF. Well concentrations at the 50th, 90th, 95th, and 99th percentiles of the Monte Carlo distribution are listed in Appendix D. In the current analysis only a 30 year municipal scenario was evaluated for most wastestreams. However, two select wastestreams (hydrorefining catalyst and unleaded gasoline tank sediment) were also modeled for a 20 year municipal scenario and 30 year industrial scenario to better assess the impact of the individual changes in modeling assumptions. The results of those select scenarios are presented in Table 5.10

### 5.3 COMPARISON OF DETERMINISTIC RESULTS AND MONTE CARLO RESULTS

It has been found that, for this analysis, the receptor well concentrations determined using the central-tendency parameters are greater than the respective 50<sup>th</sup> percentile concentrations of equivalent Monte-Carlo simulations. For unleaded gasoline tank sediment, the central tendency receptor well concentration is at least six orders of magnitude greater than the 50<sup>th</sup> percentile Monte-Carlo concentration. The deterministic central-tendency concentration approximately corresponds to the 94<sup>th</sup> percentile of the Monte-Carlo concentration CDF.

One fundamental reason to which the differences between the deterministic central-tendency runs and the 50<sup>th</sup> percentile of Monte-Carlo simulations may be attributed is the difference in definitions of the y-coordinate (YWELL) of the receptor well in the two analysis techniques.

Details are provided below.

#### 5.3.1 Definitions of Central-Tendency Parameters

The term "central tendency" for YWELL is defined differently for deterministic and stochastic runs.

#### Deterministic definition

YWELL is defined as the midpoint between the plume centerline and the edge of the plume (USEPA, 1995b, 1997a). Based on the municipal landfill central-tendency area of 60,700 square meters, the central-tendency YWELL is 117.8 meters.

#### Monte-Carlo definition

YWELL in the Monte-Carlo sense is defined as  $R\sin\theta$  where R is the radial distance from the landfill and  $\theta$  is the inclination angle from the plume centerline. In the Monte-Carlo analysis, R, based on an empirical non-parametric distribution, varies from 0 to 1,600 meters (one mile) and  $\theta$  from 0 to 90°. The 50<sup>th</sup> percentile for YWELL based on this definition is 343 meters.

YWELL is a sensitive parameter. Because the angle is allowed to vary from 0 to 90° a large number of YWELL tends to be outside the plume. It is therefore conceivable that if the receptor well is allowed to lie anywhere downgradient, the 50<sup>th</sup> percentile of the Monte-Carlo concentration CDF will be several orders of magnitude smaller than the deterministic central tendency.

This difference in definition between the y-well coordinate for the two analyses techniques has been remedied by performing Monte Carlo analyses with the receptor well constrained to lie within the plume (Tables 5.7 and 5.9). The 50<sup>th</sup> percentile well concentrations for this analysis are greater by several orders of magnitude than the analyses where the receptor was allowed to lie anywhere downgradient (within one mile) of the landfill (Tables 5.6 and 5.8) and are therefore more consistent with the central tendency well concentrations.

The results of the Monte Carlo analyses based on the two definitions of well location (well allowed anywhere downgradient within one mile and well constrained to lie within the plume) are directly compared and summarized in Table 5.1.

# 5.4 COMPARISON OF REVISED (1998) ANALYSIS RESULTS TO 1997 (NODA) RESULTS

Several observations can be made from a comparison of the 1997 analysis (NODA) results with the current 1998 analysis:

- Increasing active landfill life to 30 years increased risk in both the Monte Carlo analysis and the two high-end parameter analysis (see Tables 5.2,5.3 and 5.10).
- For the two high-end parameter analyses, the use of municipal areas slightly increased risk in some cases and slightly decreased risk in other cases because sensitivity of concentration at receptor well location to landfill area is not monotonic (see Tables 5.2 and 5.3).
- In the Monte Carlo analysis use of municipal areas decreased the risk (see Table 5.10).
- The net effect of 30 year active life and municipal areas had no definite trend (see Tables 5.2 and 5.3).
- The effect due to correcting dispersivity to account for well distance and landfill size in the two high-end parameter analysis is minimal.
- The high-end risk for unleaded gasoline tank sediment increased above 10<sup>-5</sup> according to the new sensitivity analysis. However, the Monte Carlo analysis showed risks below 10<sup>-5</sup> at the 95<sup>th</sup> percentile.
- Inclusion of exposure duration as a sensitive parameter in the sensitivity analyses had no impact on the selection of the two most sensitive parameters and therefore had no impact on the two high-end parameter analysis.
- Constraining the receptor well to lie within the plume for the Monte Carlo analysis increases risk at the 50<sup>th</sup> percentile by several orders of magnitude and increases risk somewhat at other percentiles (Tables 5.6 through 5.9).
- The risks for off-spec product and fines decrease to well below 10<sup>-5</sup> due to the use of the correct HBN.

Table 5.1 Summary of Revised 1998 Groundwater Risks for Petroleum Wastes in Off-Site Landfills

| Waste                         | Constituent                          | Revised Risks 1                          | Risks 1                        | TC-Capp       | TC-Capped Risks <sup>2</sup> |
|-------------------------------|--------------------------------------|--|--------------------------------|---------------|------------------------------|
|                               |                                      | High-End Risk <sup>3</sup>               | Monte Carlo Risk ⁴<br>(95th%)  | High-End Risk | Monte Carlo Risk<br>(95th%)  |
| Clarified Slurry Oil          | benzene.                             | 4E-06                                    | 2E-06 (2E-06)                  | NC            | NC                           |
| Hydrotreating                 | benzene                              | 1E-04                                    | 1E-05 (3E-05)                  | 3E-05         | 5E-06 (9E-06)                |
| Catalyst                      | arsenic                              | 8E-05                                    | 1E-05 (2E-05)                  | S             | NC                           |
| Hydrorefining                 | benzene                              | 7E-05                                    | 8E-06 (2E-05)                  | 3E-05         | 6E-06 (8E-06)                |
| catalyst                      | arsenic                              | 6E-04                                    | 1E-04 (4E-04)                  | 6E-04         | 1E-04 (4E-04)                |
| Crude Oil Tank                | benzene                              | 4E-05                                    | 7E-06 (1E-05)                  | 3E-05         | 5E-06 (9E-06)                |
| Unleaded Gas<br>Tank Sediment | benzene                              | 3E-05                                    | 2E-06 (6E-06)                  | 2E-05         | 2E-06 (4E-06)                |
| HF Alkylation                 | benzene                              | 1E-05                                    | 2E-06 (2E-06)                  | NC            | NC                           |
| Off-Spec Product<br>and Fines | benzo(a)-<br>anthracene <sup>7</sup> | 2E-06 <sup>5</sup><br>5E-07 <sup>6</sup> | 3E-07 (1E-06)<br>3E-07 (8E-07) | NC            | NC                           |
| Co-disposal                   | benzene                              | 8E-06                                    | 1E-06 (3E-06)                  | NC            | NC                           |
| Scenario                      | arsenic                              | 4E-06                                    | 8E-07 (2E-06)                  | NC            | NC                           |

Revised risk includes new inputs for active landfill life (30 yr.) and municipal landfill areas.

Input leaching rates were capped at TC regulatory levels for disposal in Subtitle D landfills (0.5 mg/L for benzene and 5.0 mg/L for arsenic); NC = no change because TCLP values were already below TC levels.

Risks using high-end values for two most sensitive parameters, and remaining parameters kept at median values.

Risks using Monte Carlo simulation runs at the 95th percentile level; numbers in parentheses reflect runs with well locations restricted to plume.

<sup>5</sup>Estimated TCLP input assumed to be mean value.

<sup>3</sup> Estimated TCLP assumed to be one high-end parameter.
<sup>7</sup> Risk for benzo(a)anthracene was based on HBN = 4E-04 mg/L

Table 5.2 Summary of 1998 Sensitivity Analyses with 20 Year Waste Volumes and Revised Waste Unit Areas

|   |                                |                                   |              | Industrial Landfill Areas          | Municipal    | Municipal Landfill Areas |
|---|--------------------------------|-----------------------------------|--------------|------------------------------------|--------------|--------------------------|
| ٠.                                      |                                |                                   |              |                                    |              |                          |
| Waste Stream                            | Constituent                    | 1997<br>NODA<br>Risk <sup>2</sup> | Total Risk 1 | TC Capped<br>Revised Total<br>Risk | Total Rick 1 | TC Capped Revised Total  |
| CSO sludge                              | Benzene                        | 2.5                               | 2.4          | ₹                                  | 3.5          | AN AN                    |
| Contingent CSO Sludge                   | Benzene                        | 2.5                               | 2.4          | Ž                                  | 3.5          | ¥ X                      |
| Crude Oil tank sediment                 | Benzene                        | 27.5                              | 25.2         | 21.7                               | 38.2         | 286                      |
| Hydrotreating Catalyst <sup>3</sup>     | Benzene                        | 54.3                              | 96.7         | 23.0                               | 92.0         | 24.4                     |
|   | Arsenic                        | 70.3                              | 74.7         | ¥                                  | 55.3         | ₹                        |
| Off-spec products and fines 4           | Benz(a)anthracene <sup>6</sup> | 19.3                              | 1.6          | ¥                                  | 1.7          | AM                       |
| Off-spec products and fines 5           | Benz(a)anthracene              | 4.6                               | 0.5          | ₹                                  | 0.3          | AN.                      |
| Hydrorefining catalyst <sup>3</sup>     | Benzene                        | 36.3                              | 51.2         | 27.4                               | 67.4         | 27.5                     |
|   | Arsenic                        | 680.0                             | 590.0        | 544.3                              | 394.0        | 390.0                    |
| Unleaded gasoline tank sediment Benzene | Benzene                        | 4.7                               | 16.0         | 11.6                               | 22.6         | 18.3                     |
| HFalkylation sludge                     | Benzene                        | 6.4                               | 6.0          | ¥                                  | 9.7          | ¥.                       |
| Co-disposal with H/Cracking             | Benzene                        | 8.9                               | 8.9          | ₹                                  | 6.8          | NA NA                    |
| -                                       | Arsenic                        | 7.4                               | 7.4          | ≨                                  | 3.0          | 2                        |
| Co-disposal without H/Cracking          | Benzene                        | 3.8                               | 3.8          | ₹                                  | 3.0          | ¥                        |
| 7                                       | Arsenic                        | 7.3                               | 7.3          | ₹                                  | 2.9          | ¥                        |

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk. Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6. The total risk for Benzene includes a direct risk from drinking 1.4 l/day of water (HBN = 0.01 mg/l)

2. NODA risk based on 20-year waste volumes and industrial landfill area distribution.

3. For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.

The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and two high-end parameters were selected.

The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and one additional high-end parameterwas selected. The 1998 risk for benz(a)anthracene is based on an HBN value of 4E-4 mg/L, while the 1997 NODA risk was based on an HBN value of 2E-5 mg/L.

NA: Not applicable because TCLP values were below the TC Rule level or because TC values are not available for the constituent.

Table 5.3 Summary of 1998 Sensitivity Analyses with 30 Year Waste Volumes and Revised Waste Unit Areas

|  |   |                                   | Industrial L | Industrial Landfill Areas  | Municipal | Municipal Landfill Areas |
|--|---|-----------------------------------|--------------|----------------------------|-----------|--------------------------|
|  |   |                                   |              |                            |           |                          |
| Waste Stream   | Constituent   | 1997<br>NODA<br>Risk <sup>2</sup> | Total Rick 1 | TC Capped<br>Revised Total |           | TC Capped Revised Total  |
| CSO sludge   | Benzene   | 2.5                               | 2.9          | AN AN                      | Otal RISK | Kisk<br>Vis              |
| Contingent CSO Studge  | Benzene   | 2.5                               | 2.9          | ₹ Z                        | 2.5       | <u> </u>                 |
| Crude Oil tank sediment  | Benzene   | 27.5                              | 30.7         | 25.4                       | 38 4      | 5 6                      |
| Hydrotreating Catalyst 3   | Benzene   | 54.3                              | 119.0        | 26.7                       | 128.0     | 26.3                     |
|  | Arsenic   | 70.3                              | 107.7        | ₹                          | 80.3      | AN                       |
| Off-spec products and fines 4  | Benz(a)anthracene 6   | 19.3                              | 1.8          | AN                         | 2.1       | <u> </u>                 |
| Off-spec products and fines 5  | Benz(a)anthracene   | 4.6                               | 0.7          | A N                        | 0.5       | 5 5                      |
| Hydrorefining catalyst 3   | Benzene   | 36.3                              | 63.1         | 30.7                       | 73.7      | 20.0                     |
| •  | Arsenic   | 680.0                             | 870.0        | 753.3                      | 589.7     | 0.E7C 7                  |
| Unleaded gasoline tank sediment Benzene  | Benzene   | 4.7                               | 17.3         | 12.4                       | 27.3      | 24.0                     |
| HFalkylation studge  | Benzene   | 6.4                               | 6.3          | 1                          | 10.2      | 5.12<br>AN               |
| Co-disposal with H/Cracking  | Benzene   | 8.9                               | 8.8          | ¥.                         | 7.5       | ¥ V                      |
|  | Arsenic   | 7.4                               | 8.7          | ₹                          | 3.9       | AN                       |
| Co-disposal without H/Cracking   | Benzene   | 3.8                               | 3.8          | ₹                          | 3.3       | ¥ ×                      |
|  | Arsenic   | 7.3                               | 8.6          | ¥                          | 3.8       | ₹                        |
| Carrinopopio zione anno adei e de la filia | 44 - 44 |                                   |              |                            | 7         |                          |

1. Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6.

The total risk for Benzene includes a direct risk from drinking 1.4 l/day of water (HBN = 0.01 mg/l)

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk.

2. NODA risk based on 20-year waste volumes and industrial landfill area distribution.

3. For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.

4. The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and two high-end parameteres were selected.

5. The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and one additional high-end parameter was selected.

6. The 1998 risk for benz(a)anthracene is based on an HBN value of 4E-4 mg/L, while the 1997 NODA risk was based on an HBN value of 2E-5 mg/L. NA: Not applicable because TCLP values were below the TC Rule level or because TC values are not available for the constituent.

Table 5.4 Total Risks of Constituents for the Central Tendency Scenario Using 20-yr. Waste Volumes

|   |                   | 1997             | 1998 Tot            | 1998 Total Risk 1  |
|---|-------------------|------------------|---------------------|--------------------|
| Words Stores  |                   | NODA Central     | Industrial Landfill | Municipal Landfill |
| Waste Stream  | Constituent       | endency Risk 1,2 | Areas               | Areas              |
| CSO sludge  | Benzene           | 0.1              | 0.3                 | 0.5                |
| Contingent CSO Sludge   | Benzene           | 0.1              | 0.3                 | 0.4                |
| Crude Oil Tank Sludge   | Benzene           | 0.8              | 3.4                 | 4.7                |
| Hydrotreating Catalyst  | Benzene           | 6.4              | 8.0                 | 8.9                |
|   | Arsenic           | 6.4              | 4.1                 | 3.6                |
| Off-spec products and fines (1-param)   | Benz(a)anthracene | 0.0              | 0.0                 | 0.0                |
| Off-spec products and fines (2-param) Benz(a)anthracene   | Benz(a)anthracene | 0.0              | 0.0                 | 0.0                |
| Hydrorefining catalyst  | Benzene           | 9.0              | 7.0                 | 9.3                |
|   | Arsenic           | 39.0             | 22.7                | 18.3               |
| Unleaded gasoline tank sludge   | Benzene           | NA               | 1.1                 | 0.9                |
| HFalkylation sludge   | Benzene           | 0.1              | 0.6                 | 1.5                |
| WALLA TELEVISION OF THE TAXABLE AND ADDRESS OF THE PARTY |                   |                  |                     |                    |

N/A Unleaded gasoline tank sediment sensitivity analysis not performed for NODA.

Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6.

The total risk for Benzene includes a direct risk from drinking 1.4 I/day of water (HBN = 0.01 mg/l)

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk.

2. NODA risk based on 20-year waste volumes and industrial landfill area distribution.

Table 5.5 Total Risks of Constituents for the Central Tendency Scenario Using 30-yr Waste Volumes

| A Ber Ber B   | NODA     | Industrial Landfill<br>Areas<br>0.4 | Municipal Landfill |
|---|----------|-------------------------------------|--------------------|
| e Ber Ber Ber Ber Ber Ber Ber Ber Ber Be                |          | Areas<br>0.4                        |                    |
| Ber<br>Ber<br>Ber<br>Ars                                | 0.1      | 0.4                                 | Areas              |
| Ber Ber Ber Ber Ber Ber Ars                             |          |                                     | 9.0                |
| Ber<br>Ber  |          | 0.4                                 | 9.0                |
| Ber<br>Ars  | 0.8      | 3.9                                 | 6.1                |
| Ars   | 6.4      | 11.5                                | 10.2               |
| 6   | 6.4      | 0.0                                 | 5.5                |
| on-spec products and intes (1-param) penz(a)anthracene  | cene 0.0 | 0.0                                 | 0.0                |
| Off-spec products and fines (2-param) Benz(a)anthracene | cene 0.0 | 0.0                                 | 0.0                |
| Hydrorefining catalyst Benzene                          | 0.6      | 8.1                                 | 12.2               |
| Arsenic   | 39.0     | 34.0                                | 27.5               |
| Unleaded gasoline tank sludge Benzene                   | N/A      | 1.5                                 | 1.4                |
| HFalkylation sludge Benzene                             | 0.1      | 0.6                                 | 1.6                |

'N/A Unleaded gasoline tank sediment sensitivity analysis not performed for NODA

Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6. The total risk for Benzene includes a direct risk from drinking 1.4 I/day of water (HBN = 0.01 mg/l)

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk.

2. NODA risk based on 20-year waste volumes and industrial landfill area distribution.

(30 Year Waste Volumes, Municipal Landfill Areas, Receptor Well Anywhere) Table 5.6 Summary of Total Risk and DAF's for 1998 Monte Carlo Analyses

|   |                   |                              | L             |         |       |                 |       |           | ,         |        |         |       |          |
|---|-------------------|------------------------------|---------------|---------|-------|-----------------|-------|-----------|-----------|--------|---------|-------|----------|
|   |                   |                              |               |         | 1998  | 1998 Total Risk | sk 1  |           |           | 16     | 1998 D/ | DAF   |          |
|   |                   | HBN<br>HBN                   | NODA<br>95-th |         |       |                 |       |           |           |        |         |       |          |
| Waste Stream                              | Constituent       | Total <sup>1</sup><br>(ma/L) | Perc.         | 50-th   | 90-th | 95-th           | 98-th | 99-th     | 50-th     | 90-th  | 95-th   | 98-th | 47-66    |
| CSO sludge                                | Benzene           | 6 23F-03                     | =             | ď       |       | 3 3             | haic  | 96<br>100 | perc.     | perc.  | perc.   | perc. | perc.    |
| Continuent CSO Studes                     | c                 | 2                            | -             | 3.35-03 | 6.9   | 7.8             | 3.1   | 4.1       | 1.70E+05  | 9.4    | 4.4     | 2.4   | 1.3      |
| Some Coo single                           | genzene           | 6.23E-03                     | 1.1           | 1.5E-05 | 0.4   | 1.0             | 2.3   | 3.1       | 5.83E+05  | 19.2   | 7.3     | 3.0   | -        |
| Crude Oil tank sediment                   | Benzene           | 6.23E-03                     | 4.5           | 4.4E-05 | 1.8   | 7.2             | 22.4  | 36.6      | 9 055+05  | 37.6   | :       | 3 5   | -        |
| Hydrotreating Catalyst 3                  | Benzene           | 6.23E-03                     | 10.6          | 1.8E-05 | 2.3   | 11.1            | 49.1  | 122.4     | 8 18E 108 | 5.50   | 3.5     | 0.0   | <br>     |
|   | Arsenic           | 3.00E-04                     | 9.6           | 6 8F-10 | 00    | 44 5            |       |           | 3         | 7.10   | 0.0     | 7.0   | 20       |
| Off-ener products and fines 4             | D                 |                              |               | 2 70.5  | 2     | <u>:  </u>      | 3     | 93.9      | 7.48E+11  | 6.66   | 19.3    | 5.1   | 6.       |
| on spec products and lines                | benz(a)anthracene | 4.00E-04                     | 5.4           | 0.0E+00 | 0.0   | 0.3             | 1.9   | 4.4       | infinity  | 1989.0 | 180.0   | 22.6  | 1.5      |
| Off-spec products and fines 5             | Benz(a)anthracene | 4.00E-04                     | 4.4           | 0.0E+00 | 0.0   | 0.3             | 1.5   | 2.8       | infinity  | 7 609  | 2 3     | 2 ;   | ?        |
| Hydrorefining catalyst 3                  | Benzene           | 6 23F-03                     | 83            | 6 3E 05 | 000   | 5               | 1 8   | 2         | mum mr    | 033.7  | 4.80    | c:    | 7.3      |
|   | Arconia           | 2000                         | 3             | 20.0    | 2.5   | R.              | 33.7  | 82.7      | 7.20E+05  | 13.0   | 5.2     | 5.6   | 1.3      |
|   | Olege III C       | 3.00E-04                     | 124.9         | 3.6E-06 | 38.5  | 146.1           | 670.0 | 1576.0    | 3.97E+09  | 303.8  | 57.7    | 11.0  | 1.7      |
| Unleaded gasoline tank sediment   Benzene |                   | 6.23E-03                     | 1.7           | 2.8E-07 | 4.0   | 1.9             | 8.2   | 18.0      | 2 24E+08  | 1400   | 6       | ! ! ; | <u> </u> |
| HFalkylation studge                       | Benzene           | 6.23E-03                     | 1.6           | 1.9E-05 | 9.0   | 2               | 30    | 2 7       | 20. 25.2  | 20.0   | 53.3    | اة    | 0.       |
| Co-disposal with H/Cracking               | Benzene           | 6.23E-03                     | 6.0           | 1.0E-07 | 0.3   | 12              | 2 6   |           | 1.07 1.03 | 0.21   | 5.3     | 2.7   | 1.3      |
|   | Arsenic           | 3.00F-04                     | 80            | 3 0F-20 | 5     | 4 6             | ? ;   | 2.0       | 0.00=+0/  | 29.8   | 5.9     | 2.6   | 4.       |
| Co-disposal without H/Cracking            |                   | 00 700                       |               | 0.01-20 | 3,    | 0.0             | -     | 9.6       | 2.87E+20  | 9.94   | 8.7     | 2.7   | 1.2      |
| 丁   |                   | 0.23E-U3                     | 20            | 8.0E-08 | 0.3   |                 | 4.1   | 8.5       | 7.24E+07  | 19.1   | 5.4     | 2.4   | 1.2      |
|   | Arsenic           | 3.00E-04                     | 0.8           | 4.4E-20 | 0.2   | 6.0             | 3.1   | 6.0       | 4.17E+20  | 45.0   | 0.6     | 27    | 13       |

Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6.

The total risk for Benzene includes a direct risk from drinking 1.4 l/day of water (HBN ≈ 0.01 mg/l)

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk.

2. NODA risk based on 20-year waste volumes and industrial landfill area distribution and the receptor well was located anywhere within 180 degrees of the plume centerline.

The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis. For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.

The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis.

The 1998 risk for benz(a)anthracene is based on an HBN value of 4E-4 mg/L, while the 1997 NODA risk was based on an HBN value of 2E-5 mg/L.

Table 5.6 Summary of Total Risk and DAF's for 1998 Monte Carlo Analyses (30 Year Waste Volumes, Municipal Landfill Areas, Receptor Well Anywhere)

|   |  | 4.       |                       |         | 1998  | 1998 Total Risk | sk 1  |        |          | 19     | 1998 DAF | L.    |       |
|---|--|----------|-----------------------|---------|-------|-----------------|-------|--------|----------|--------|----------|-------|-------|
|   |  | HBN      | 1997<br>NODA<br>95-th |         |       |                 |       |        |          |        |          |       |       |
|   |  | Total1   | Perc.                 | 50-th   | 47-06 | 95-th           | 98-th | tt-66  | 50-th    | 47-06  | 95-th    | 98-th | 99-th |
| Waste Stream  | Constituent  | (mg/L)   | Risk <sup>2</sup>     | perc.   | perc. | perc.           | perc. | perc.  | perc.    | perc.  | perc.    | perc. | perc. |
| CSO sludge  | Benzene  | 6.23E-03 | 1.1                   | 5.5E-05 | 6.0   | 1.8             | 3.1   | 4.1    | 1.70E+05 | 9.4    | 4.4      | 2.4   | 1.3   |
| Contingent CSO Sludge   | Benzene  | 6.23E-03 | 1.1                   | 1.5E-05 | 0.4   | 1.0             | 2.3   | 3.1    | 5.83E+05 | 19.2   | 7.3      | 3.0   | 1.4   |
| Crude Oil tank sediment   | Benzene  | 6.23E-03 | 4.5                   | 4.4E-05 | 1.8   | 7.2             | 22.4  | 36.6   | 9.95E+05 | 37.6   | 11.3     | 4.0   | 1.5   |
| Hydrotreating Catalyst 3  | Benzene  | 6.23E-03 | 10.6                  | 1.8E-05 | 2.3   | 11.1            | 49.1  | 122.4  | 6.18E+06 | 61.2   | 18.8     | 6.2   | 1.8   |
|   | Arsenic  | 3.00E-04 | 9.6                   | 6.8E-10 | 2.9   | 11.5            | 33.1  | 63.9   | 7.48E+11 | 6.66   | 19.3     | 5.1   | 1.3   |
| Off-spec products and fines 4   | Benz (a) anthracene <sup>8</sup>   | 4.00E-04 | 5.4                   | 0.0E+00 | 0.0   | 0.3             | 1.9   | 4.4    | infinity | 1989.0 | 180.0    | 23.6  | 1.5   |
| Off-spec products and fines 5   | Benz(a)anthracene  | 4.00E-04 | 4.4                   | 0.0E+00 | 0.0   | 0.3             | 1.5   | 2.8    | infinity | 693.7  | 69.4     | 11.5  | 1.3   |
| Hydrorefining catalyst 3  | Benzene  | 6.23E-03 | 8.3                   | 6.3E-05 | 3.0   | 7.9             | 33.7  | 82.7   | 7.20E+05 | 13.0   | 5.2      | 2.6   | 1.3   |
|   | Arsenic  | 3.00E-04 | 124.9                 | 3.6E-06 | 38.5  | 146.1           | 670.0 | 1576.0 | 3.97E+09 | 303.8  | 57.7     | 11.2  | 1.7   |
| Unleaded gasoline tank sediment   | Benzene  | 6.23E-03 | 1.7                   | 2.8E-07 | 0.4   | 1.9             | 8.2   | 18.0   | 2.24E+08 | 148.8  | 29.5     | 6.7   | 1.5   |
| HFalkylation sludge   | Benzene  | 6.23E-03 | 1.6                   | 1.9E-05 | 9.0   | 1.5             | 3.0   | 4.4    | 4.67E+05 | 12.6   | 5.3      | 2.7   | 1.3   |
| Co-disposal with H/Cracking   | Benzene  | 6.23E-03 | 6.0                   | 1.0E-07 | 0.3   | 1.2             | 4.3   | 10.0   | 6.05E+07 | 19.8   | 6.9      | 2.6   | 4.1   |
|   | Arsenic  | 3.00E-04 | 0.8                   | 3.9E-20 | 0.2   | 0.8             | 3.1   | 9.9    | 2.87E+20 | 46.6   | 8.7      | 2.7   | 1.2   |
| Co-disposal without H/Cracking  | Benzene  | 6.23E-03 | 8.0                   | 8.0E-08 | 0.3   | 1.1             | 4.1   | 8.5    | 7.24E+07 | 19.1   | 5.4      | 2.4   | 1.2   |
|   | Arsenic  | 3.00E-04 | 0.8                   | 4.4E-20 | 0.2   | 6.0             | 3.1   | 6.0    | 4.17E+20 | 45.0   | 9.0      | 2.7   | 1.2   |
| A to the state of | A country of the coun |          |                       |         | : ;   |                 |       |        |          |        |          |       |       |

Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6.

The total risk for Benzene includes a direct risk from drinking 1.4 l/day of water (HBN = 0.01 mg/l)

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk.

- 2. NODA risk based on 20-year waste volumes and industrial landfill area distribution and the receptor well was located anywhere within 180 degrees of the plume centerline.
- For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.
- The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis.
- The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis.
  - The 1998 risk for benz(a)anthracene is based on an HBN value of 4E-4 mg/L, while the 1997 NODA risk was based on an HBN value of 2E-5 mg/L.

Table 5.7 Summary of Total Risk and DAF's for 1998 Monte Carlo Analyses (30 Year Waste Volumes, Municipal Landfill Areas, Receptor Well within Plume)

| ٧                               |   |                    |                       |         | 1998  | 1998 Total Risk 1 | sk 1   |        |         | 19              | 1998 DAF |       |       |
|---------------------------------|---|--------------------|-----------------------|---------|-------|-------------------|--------|--------|---------|-----------------|----------|-------|-------|
|                                 |   | HBN                | 1997<br>NODA<br>95-th | #45     | -     |                   |        |        | ·       |                 |          |       |       |
| Wasta Straam                    | Conditions                              | Total <sup>1</sup> | Perc.                 | 50-th   | 90-th | 95-th             | ₩-86   | 99-th  | 50-th   | <del>1</del> 06 | 95-th    | 98-th | 99-th |
|                                 | Tilanina                                |                    | 238                   | perc.   | Derc. | perc.             | perc.  | perc.  | perc.   | perc.           | perc.    | perc. | perc. |
| CSO sludge                      | Benzene                                 | 6.23E-03           | 1.1                   | 5.0E-02 | 1.3   | 2.2               | 3.3    | 4.1    | 1.9E+02 | 6.5             | 3.8      | 2.3   | 1.3   |
| Contingent CSO Sludge           | Benzene                                 | 6.23E-03           | 1.1                   | 3.4E-02 | 0.8   | 1.5               | 2.5    | 3.4    | 2.8E+02 | 10.0            | 5.4      | 2.8   | 1.3   |
| Crude Oil tank sediment         | Benzene                                 | 6.23E-03           | 4.5                   | 9.7E-02 | 5.6   | 14.1              | 33.3   | 52.4   | 6.0E+02 | 16.2            | 7.5      | 3.6   | 1.5   |
| Hydrotreating Catalyst 3        | Benzene                                 | 6.23E-03           | 10.6                  | 1.5E-01 | 10.6  | 32.7              | 107.7  | 207.7  | 9.4E+02 | 25.1            | 11.8     | 5.1   | 1.7   |
|                                 | Arsenic                                 | 3.00E-04           | 9.6                   | 1.3E-01 | 9.3   | 22.9              | 54.8   | 89.5   | 4.3E+03 | 33.7            | 12.7     | 4.4   | 1.5   |
| Off-spec products and fines 4   | Benz(a)anthracene <sup>6</sup> 4.       | 4.00E-04           | 5.4                   | 7.5E-05 | 0.3   | 1.1               | 3.8    | 6.8    | 1.5E+06 | 273.1           | 68.7     | 14.8  | 1.6   |
| Off-spec products and fines 5   | Benz(a)anthracene <sup>6</sup> 4.00E-04 | 4.00E-04           | 4.4                   | 5.9E-05 | 0.2   | 8.0               | 2.4    | 4.4    | 5.5E+05 | 113.1           | 28.8     | 7.5   | 1.3   |
| Hydrorefining catalyst 3        | Benzene                                 | 6.23E-03           | 8.3                   | 2.1E-01 | 7.2   | 17.8              | 64.0   | 104.0  | 2.4E+02 | 9.7             | 4.3      | 2.4   | 1.3   |
|                                 | Arsenic                                 | 3.00E-04           | 124.9                 | 1.7E+00 | 119.0 | 363.3             | 1039.3 | 1919.3 | 8.7E+03 | 97.3            | 32.5     | 9.0   | 1.9   |
| Unleaded gasoline tank sediment | Benzene                                 | 6.23E-03           | 1.7                   | 3.0E-02 | 2.0   | 5.7               | 14.8   | 24.7   | 2.4E+03 | 39.5            | 15.7     | 5.3   | 1.8   |
| HFalkylation sludge             | Benzene                                 | 6.23E-03           | 1.6                   | 4.6E-02 | 1.2   | 2.1               | 3.8    | 5.5    | 2.0E+02 | 7.4             | 4.2      | 2.5   | 1.2   |
| Co-disposal with H/Cracking     | Benzene                                 | 6.23E-03           | 6.0                   | 1.5E-02 | 1.0   | 2.7               | 8.0    | 15.6   | 4.0E+02 | 8.2             | 4.3      | 2.3   | 1.3   |
|                                 | Arsenic                                 | 3.00E-04           | 0.8                   | 3.9E-03 | 0.7   | 2.1               | 6.2    | 13.6   | 5.2E+03 | 13.6            | 5.4      | 2.5   | =     |
| Co-disposal without H/Cracking  | Benzene                                 | 6.23E-03           | 0.8                   | 1.3E-02 | 6.0   | 2.2               | 0.9    | 11.0   | 4.4E+02 | 8.7             | 4.3      | 2.3   | 1     |
|                                 | Arsenic                                 | 3.00E-04           | 9.0                   | 4.1E-03 | 9.0   | 2.0               | 6.5    | 13.0   | 5.3E+03 | 13.5            | 5.5      | 2.5   | 1.2   |

Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6.

The total risk for Benzene includes a direct risk from drinking 1.4 I/day of water (HBN = 0.01 mg/I)

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk.

- NODA risk based on 20-year waste volumes and industrial landfill area distribution and the receptor well was located anywhere within 180 degrees of the plume centerline.
- For hydrotreating and hydrorefining, all waste quantities, except those managed in Subitite C landfills, were modeled including reclaimed waste. က်
- 4. The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis.
- The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis. ۍ
  - The 1998 risk for benz(a)anthracene is based on an HBN value of 4E-4 mg/L, while the 1997 NODA risk was based on an HBN value of 2E-5 mg/L.

Table 5.8 Summary of Total Risk and DAF's 1998 TC Capped Monte Carlo Analyses (30 Year Waste Volumes, Municipal Landfill Areas, Receptor Well Anywhere)

| •  |                              |           | Ş      | ٠       | 1998  | 1998 Total Risk | sk 1  |        |         |       | 1998 D | DAF      |       |
|--|------------------------------|-----------|--------|---------|-------|-----------------|-------|--------|---------|-------|--------|----------|-------|
|  |                              | ,         | NODA   |         |       |                 |       |        |         |       |        |          |       |
| W.   |                              | HBN Total | Perc.  | 50-th   | 90-th | 95-th           | 98-th | 99+    | 50-th   | 90-th | 95-th  | 98-th    | 47-66 |
| waste Sueam  | Constituent                  | (mg/L)    | Risk 2 | perc.   | perc. | perc.           | perc. | perc.  | perc.   | perc. | perc.  | perc.    | Derc. |
| CSO sludge   | Benzene                      | 6.23E-03  | ¥      | NA      | ΝΑ    | Ą               | ₹     | ₹      | ≨       | ≨     | ž      | Ą        | AN    |
| Contingent CSO Sludge                                | Benzene                      | 6.23E-03  | ¥      | Ϋ́      | ₹     | ¥               | ž     | ₹      | ≨       | ž     | ž      | ž        | ¥ X   |
| Crude Oil tank sediment                              | Benzene                      | 6.23E-03  | 3.3    | 7.5E-06 | 1.3   | 5.2             | 13.6  | 20.0   | 3.7E+06 | 28.0  | 8.1    | 3.5      | -     |
| Hydrotreating Catalyst <sup>3</sup>                  | Benzene                      | 6.23E-03  | 4.4    | 2.8E-06 | 4.    | 5.4             | 13.7  | 22.4   | 1.6E+07 | 27.5  | 8.6    | 333      | - 7   |
|  | Arsenic                      | 3.00E-04  | ¥      | ¥       | ş     | ¥               | ž     | ₹      | ₹       | ¥     | AN     | AM       | 2 PA  |
| Off-spec products and fines4                         | Benz(a)anthracene            | 4.00E-04  | ¥      | ₹<br>X  | ₹     | ¥               | ¥     | ₹      | ¥       | Ψ.    | ΨN     | NA N     | 2 2   |
| Off-spec products and fines <sup>5</sup>             | Benz(a)anthracene            | 4.00E-04  | ₹      | Ϋ́      | ≨     | ž               | ž     | ≨      | ¥       | ₹ Z   | Y AN   | <u> </u> | 5 2   |
| Hydrorefining catalyst <sup>3</sup>                  | Benzene                      | 6.23E-03  | 6.3    | 5.6E-05 | 2.5   | 6.2             | 12.1  | 18.7   | 5.4E+05 | 10.5  | 4.6    | 2.4      | ج اج  |
|  | Arsenic                      | 3.00E-04  | 123.0  | 4.0E-06 | 36.8  | 137.3           | 606.0 | 1293.0 | 2.0E+09 | 185.0 | 38.6   | 0        | 2 4   |
| Unleaded gasoline tank sediment Benzene              | Benzene                      | 6.23E-03  | 1.0    | 3.3E-07 | 4.0   | 1.6             | 6.9   | 13.0   | 1.2E+08 | 102.5 | 23.2   | 2.0      | 2 2   |
| HFalkylation sludge                                  | Benzene                      | 6.23E-03  | ž      | ¥       | ₹     | ž               | ž     | ₹      | ₹       | ¥     | Ą      | AN       | A N   |
| Co-disposal with H/Cracking                          | Benzene                      | 6.23E-03  | 0.7    | ΑΝ      | ş     | ¥               | ₹     | ≨      | ¥       | ₹     | ₹      | ¥.       | S Z   |
|  | Arsenic                      | 3.00E-04  | 8.0    | ¥       | ₹     | ¥               | ¥     | ₹      | ¥       | ž     | A A    | Ą        | 4N    |
| Co-disposal without H/Cracking                       | Benzene                      | 6.23E-03  | 0.7    | ¥       | ₹     | ¥               | ₹     | ₹      | ¥       | ₹     | ₹      | ₹        | ₹   ₹ |
|  | Arsenic                      | 3.00E-04  | 8.0    | ¥       | ≨     | ş               | ¥     | ₹      | ₹       | ¥     | ¥      | Ą        | AN    |
| 1 Carcinopanic risks are assessed on the mile at the | the chief of the contract of | 11.00     | :      |         |       |                 |       |        |         |       |        |          | 5     |

Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6.

The total risk for Benzene includes a direct risk from drinking 1.4 l/day of water (HBN ≈ 0.01 mg/l)

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk.

2. NODA risk based on 20-year waste volumes and industrial landfill area distribution and the receptor well was located anywhere within 180 degrees of the plume centerline.

3. For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.

The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis.

The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis.

NA: Not applicable because TCLP values were below the TC Rule level or because TC values are not available for the constituent.

Table 5.9 Summary of Total Risk and DAF's for 1998 TC Capped Monte Carlo Analyses (30 Year Waste Volumes, Municipal Landfill Areas, Receptor Well within Plume)

|   |                   |           |                       |         | 199      | 1998 Total Risk | 주의<br>- | *      |         | <u> </u> | 1998 DAF | u,     |        |
|---|-------------------|-----------|-----------------------|---------|----------|-----------------|---------|--------|---------|----------|----------|--------|--------|
|   |                   |           | 1997<br>NODA<br>95-th | -       |          |                 |         |        |         |          |          |        |        |
|   | ,                 | HBN Total | Perc.                 | 50-th   | 90-th    | 95-th           | 98-th   | 99-th  | 50-th   | 90-th    | 95-th    | 98-th  | 99-th  |
| Waste Stream                                | Constituent       | (mg/L)    | Risk '                | perc.   | perc.    | perc.           | perc.   | perc.  | perc.   | perc.    | perc.    | perc.  | perc.  |
| CSO sludge Be                               | Benzene           | 6.23E-03  | AN<br>A               | NA<br>N | NA<br>NA | NA              | ¥       | ΑN     | ¥       | Ä        | ¥        | ΑĀ     | ¥      |
| Contingent CSO Sludge Be                    | Benzene           | 6.23E-03  | ΑN                    | ΝΑ      | ₹        | ¥               | ¥       | ¥      | ₹       | ¥        | ¥.       | ¥      | ₹      |
| Crude Oil tank sediment Be                  | Benzene           | 6.23E-03  | 3.3                   | 0.1     | 3.8      | 8.7             | 17.7    | 24.5   | 4.6E+02 | 12.7     | 6.3      | 3.0    | 1.3    |
| Hydrotreating Catalyst <sup>3</sup> Be      | Benzene           | 6.23E-03  | 4.4                   | 0.1     | 3.9      | 8.9             | 17.5    | 24.6   | 4.2E+02 | 12.7     | 6.2      | 3.0    | 1.3    |
| Ar  | Arsenic           | 3.00E-04  | AN                    | A.      | ¥        | ž               | ¥       | ž      | ₹       | ¥        | ¥        | A<br>A | ¥      |
| Off-spec products and fines <sup>4</sup> Be | Benz(a)anthracene | 4.00E-04  | ΝΑ                    | Ā       | NA       | Ą               | Ą       | ž      | ¥       | ¥        | ¥        | AN     | ₹      |
| Off-spec products and fines <sup>5</sup> Be | Benz(a)anthracene | 4.00E-04  | Ą                     | AA      | NA<br>A  | NA<br>AN        | ΑN      | Ą      | ¥.      | ž        | Ą        | Ą      | ž      |
| Hydrorefining catalyst <sup>3</sup> Be      | Benzene           | 6.23E-03  | 6.3                   | 0.2     | 4.6      | 8.4             | 15.7    | 22.9   | 1.8E+02 | 9.9      | 3.8      | 2.3    | 1.3    |
| An  | Arsenic           | 3.00E-04  | 123.0                 | 1.7     | 106.8    | 318.2           | 855.0   | 1448.7 | 4.7E+03 | 65.4     | 23.5     | 7.5    | 1.3    |
| Unleaded gasoline tank sediment Benzene     | enzene            | 6.23E-03  | 1.0                   | 0.0     | 1.5      | 3.9             | 8.9     | 13.9   | 2.1E+03 | 36.3     | 13.9     | 5.3    | 1.5    |
| HFalkylation sludge Be                      | Benzene           | 6.23E-03  | ΑĀ                    | NA      | A<br>A   | NA              | A.      | ≨      | ž       | ¥        | ₹        | ¥      | ¥      |
| Co-disposal with H/Cracking Be              | Benzene           | 6.23E-03  | 0.7                   | ¥       | Ϋ́       | NA              | Ą       | ¥      | Ą       | ¥        | ¥        | ΑŽ     | A<br>A |
| AR  | Arsenic           | 3.00E-04  | 0.8                   | NA      | Α¥       | NA              | NA      | ¥      | ¥       | ¥        | ¥        | ¥      | A<br>A |
| Co-disposal without H/Cracking Benzene      | enzene            | 6.23E-03  | 0.7                   | NA      | NA<br>A  | NA              | NA      | ΑN     | ¥       | ¥        | ¥        | ₹      | ¥      |
| . Aת  | Arsenic           | 3.00E-04  | 0.8                   | NA      | NA       | NA              | NA      | ΑN     | ¥       | ¥        | ¥        | ž      | ¥      |

Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6.

The total risk for Benzene includes a direct risk from drinking 1.4 l/day of water (HBN = 0.01 mg/l)

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk.

- 2. NODA risk based on 20-year waste volumes and industrial landfill area distribution and the receptor well was located anywhere within 180 degrees of the plume centerline.
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- The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis.
- The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis.

NA: Not applicable because TCLP values were below the TC Rule level or because TC values are not available for the constituent

Table 5.10 Impact of Increased Waste Volumes Compared With Impact of Municipal Landfill Areas on Total Risk of Select Wastestreams

|   |                    | 1997 NODA Risk | NRisk 2        | Comp           | arison of      | 30 year      | vs. 20 year    | r volumes      | and mun      | Comparison of 30 year vs. 20 year volumes and municipal vs. Industrial areas | ndustrial a                | reas         |
|---|--------------------|----------------|----------------|----------------|----------------|--------------|----------------|----------------|--------------|--|----------------------------|--------------|
|   |                    | Two High-      | 95-th<br>perc. | 90-th<br>perc. | 90-th<br>perc. | th-06        | 95-th<br>perc. | 95-th<br>perc. | 95-th        | 99-th<br>perc.   | 99-th<br>perc.             | 99-th        |
| Waste Stream                                      | Scenario           | Parameter      | Risk 1         | Well<br>Conc.  | Risk 1         | perc.<br>DAF | Well<br>Conc.  | Risk 1         | perc.<br>DAF | Well<br>Conc.  | Total<br>Risk <sup>1</sup> | perc.<br>DAF |
| Hydrorefining catalyst 3                          | Municipal 30-year  | 36.3           | 8.3            | 1.87E-02       | 3.0            | 13.0         | 4.91E-02       | 6.7            | 5.2          | 5.15E-01   | 51.5                       | 2.6          |
|   | Industrial 30-year | 36.3           | 8.3            | 2.16E-02       | 3.5            | 11.5         | 5.66E-02       | 9.1            | 4.5          | 0.6272   | 62.7                       | 2.4          |
|   | Municipal 20-year  | 36.3           | 8.3            | 1.57E-02       | 2.5            | 15.2         | 4.29E-02       | 6.9            | 5.7          | 4.38E-01   | 43.8                       | 2.8          |
| Unleaded gasoline tank sediment Municipal 30-year | Municipal 30-year  | 4.7            | 1.7            | 2.64E-03       | 0.4            | 148.8        | 1.17E-02       | 1.9            | 29.5         | 1.12E-01   | 11.2                       | 6.7          |
|   | Industrial 30-year | 4.7            | 1.7            | 2.48E-03       | 0.4            | 152.7        | 1.33E-02       | 2.1            | 28.2         | 9.55E-02   | 9.5                        | 9.9          |
|   | Municipal 20-year  | 4.7            | 1.7            | 1.93E-03       | 0.3            | 202.6        | 8.83E-03       | 4.1            | 41.8         | 9.01E-02   | 9.0                        | 4.8          |

Carcinogenic risks are presented as the ratio of the concentration at the well to the concentration corresponding to a risk of 1E-6.

and an indirect risk from showering (6.05E-5 risk per 1mg/l benzene). Arsenic and benz(a)anthracene include only direct ingestion risk. The total risk for Benzene includes a direct risk from drinking 1.4 I/day of water (HBN = 0.01 mg/l)

2. NODA risk based on 20-year waste volumes and industrial landfill area distribution.
3. For hydrotreating and hydrorefining, all waste guantities, except those managed in Sul

For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.

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# APPENDIX A SENSITIVITY ANALYSES

Table A.1 Sensitivity Analysis CSO Off-site Landfill Scenario, Benzene -- Industrial Areas -- 20 Year Active Life

|                 |        |       |                |        | _                              |              | <del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del> |        |        |                |        | /66L         |      | 1998         |      |
|-----------------|--------|-------|----------------|--------|--------------------------------|--------------|--|--------|--------|----------------|--------|--------------|------|--------------|------|
| Two-Parameters  | Area   | Depth | Depth Wst. Vol |        | TCLP Wst Conc Cw / Cl Wst. Den | ວ / <u>×</u> | Wst. Den   | III    | X-well | X-well Y- Well | Z-Well | 9-year Avg.  |      | 9-year Avg.  |      |
| at High End     | (m2)   | (m)   | (m3)           | (mg/L) | (mg/kg)                        | (L/kg)       | (g/cm3)  | (m/yr) | Œ      | (E)            | (E)    | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case       | 20200  | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 1.4  | 0.17   | 430    | 85.91          | 6.5    | 4.78E-04     |      | 2.00E-03     |      |
|                 | 20200  | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 1.4  | 0.46   | 102    | 60.76          | 6.5    | 3.07E-03     | 7    | 1.52E-02     | -    |
| Area & Wst. Vol | 162000 | 2.6   | 44900          | 0.059  | 1.2                            | 20.34        | 1.4  | 0.17   | 430    | 165.01         | 6.5    | 1.55E-02     | F    | 1.31E-02     | 2    |
| Xwell & Wst Vol | 20200  | 2.6   | 44900          | 0.059  | 1.2                            | 20.34        | 1.4  | 0.17   | 102    | 92.09          | 6.5    | 1.08E-03     | 16   | 1.04E-02     | 8    |
| Ywell & Xwell   | 20200  | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 1.4  | 0.17   | 102    | 0.00           | 6.5    | 3.23E-03     | 5    | 1.03E-02     | 4    |
| TCLP & xwell    | 20200  | 2.6   | 2635.71        | 0.084  | 1.2                            | 14.29        | 4.   | 0.17   | 102    | 92.09          | 6.5    | 1.45E-03     | 13   | 9.15E-03     | 5    |
| Vol             | 20200  | 2.6   |                | 0.059  | 1.2                            | 20.34        | 1.4  | 0.17   | 430    | 0.00           | 6.5    | 2.16E-03     | 9    | 8.72E-03     | 9    |
| Xwell & Zwell   | 20200  | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 1.4  | 0.17   | 102    | 92.09          | 1.3    | 1.53E-03     | 12   | 8.68E-03     | -    |
|                 | 20200  | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 1.4  | 0.46   | 430    | 0.00           | 6.5    | 4.83E-03     | 3    | 8.67E-03     | 8    |
| lo              | 20200  | 5.6   |                | 0.059  | 1.2                            | 20.34        | 1.4  | 0.46   | 430    | 85.91          | 6.5    | 1.34E-03     | 14   | 7.63E-03     | 6    |
| n.              | 20200  | 2.6   | 2635.71        | 0.084  | 1.2                            | 14.29        | 1.4  | 0.17   | 430    | 0.00           | 6.5    | 2.87E-03     | 80   | 7.12E-03     | 9    |
|                 | 162000 | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 4.   | 0.17   | 102    | 142.35         | 6.5    | 5.61E-03     | 2    | 5.73E-03     | 11   |
| it. Vol         | 20200  | 5.6   |                | 0.084  | 1.2                            | 14.29        | 4.1  | 0.17   | 430    | 85.91          | 6.5    | 6.99E-04     | 28   | 4.26E-03     | 12   |
|                 | 20200  | 2.6   | 2635.71        | 0.084  | 1.2                            | 14.29        | 1.4  | 0.46   | 430    | 85.91          | 6.5    | 1.64E-03     | F    | 4.26E-03     | 13   |
| Area & Ywell    | 162000 | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 1.4  | 0.17   | 430    | 0.00           | 6.5    | 3.24E-03     | 4    | 2.95E-03     | 4    |
|                 | 20200  | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 4.1  | 0.17   | 430    | 0.00           | 1.3    | 9.50E-04     | 11   | 2.82E-03     | 15   |
| Area & TCLP     | 162000 | 2.6   | 2635.71        | 0.084  | 1.2                            | 14.29        | 1.4  | 0.17   | 430    | 165.01         | 6.5    | 3.17E-03     | 9    | 2.59E-03     | 16   |
| Area & Infil    | 162000 | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 4.1  | 0.46   | 430    | 165.01         | 6.5    | 2.61E-03     | 6    | 2.41E-03     | 1-   |
| Infil & Zwell   | 20200  | 5.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 1.4  | 0.46   | 430    | 85.91          | 1.3    | 4.84E-04     | 19   | 1.65E-03     | 18   |
| Zwell           | 20200  | 2.6   | 44900          | 0.059  | 1.2                            | 20.34        | 4.1  | 0.17   | 430    | 85.91          | 1.3    | 2.08E-04     | 21   | 1.46E-03     | 19   |
|                 | 162000 | 2.6   | 2635.71        | 0.059  | 1.2                            | 20.34        | 1.4  | 0.17   | 430    | 165.01         | 1.3    | 1.27E-03     | 15   | 1.28E-03     | 82   |
| TCLP & Zwell    | 20200  | 2.6   | 2635.71        | 0.084  | 1.2                            | 14.29        | 4.   | 0.17   | 430    | 85.91          | 1.3    | 2.77E-04     | 8    | 1.19E-03     | 21   |

Table A.2 Sensitivity Analysis CSO Off-site Landfill Scenario, Benzene -- Municipal Areas -- 20 Year Active Life

|                  |        |       |                |        |                           |          |          |        |        |                       |        | 1997         |      | 1998                           |      |
|------------------|--------|-------|----------------|--------|---------------------------|----------|----------|--------|--------|-----------------------|--------|--------------|------|--------------------------------|------|
| Two-Parameters   | Area   | Depth | Depth Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | <u> </u> | Wst. Den | Infil  | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |      | 9-year Avg.                    |      |
| at High End      | (m2)   | (E)   | (m3)           | (mg/L) | (mg/kg)                   | (L/kg)   | (g/cm3)  | (m/yr) | (m)    | (m)                   | Œ      | Conc. (mg/L) | Rank | Conc. (mg/L) Rank Conc. (mg/L) | Rank |
| Base Case        | 60705  | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 430    | 117.75                | 6.5    | 4.78E-04     |      | 2.90E-03                       |      |
| Xwell & Wst Vol  | 60705  | 2.6   | 44900          | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 102    | 93.79                 | 6.5    | 1.08E-03     | 16   | 2.15E-02                       | -    |
| Infil & Wst. Vol | 60705  | 2.6   | 44900          | 0.059  | 1.2                       | 20.34    | 1.4      | 0.46   | 430    | 117.75                | 6.5    | 1.34E-03     | 14   | 1.59E-02                       | 2    |
| Area & Wst. Vol  | 420888 | 2.6   | 44900          | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 430    | 238.82                | 6.5    | 1.55E-02     | -    | 1.41E-02                       | က    |
| Ywell & Wst. Vol | 60705  | 2.6   | 44900          | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 2.16E-03     | 19   | 1.31E-02                       | 4    |
| Infil & Xwell    | 60705  | 2.6   | 2635.71        | 650.0  | 1.2                       | 20.34    | 4.1      | 0.46   | 102    | 93.79                 | 6.5    | 3.07E-03     | 7    | 1.07E-02                       | 2    |
| TCLP & xwell     | 60705  | 2.6   | 2635.71        | 0.084  | 1.2                       | 14.29    | 1.4      | 0.17   | 102    | 93.79                 | 6.5    | 1.45E-03     | 13   | 1.07E-02                       | 9    |
| Ywell & Xwell    | 60705  | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 102    | 0.00                  | 6.5    | 3.23E-03     | 5    | 1.03E-02                       | -    |
| TCLP & Wst. Vol  | 60705  | 2.6   | 44900          | 0.084  | 1.2                       | 14.29    | 4.       | 0.17   | 430    | 117.75                | 6.5    | 6.99E-04     | 18   | 1.00E-02                       | 8    |
| Xwell & Zwell    | 60705  | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 102    | 93.79                 | 1.3    | 1.53E-03     | 12   | 8.73E-03                       | 6    |
| Ywell & TCLP     | 60705  | 2.6   | 2635.71        | 0.084  | 1.2                       | 14.29    | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 2.87E-03     | 80   | 5.76E-03                       | 9    |
| Ywell & Infil    | 60705  | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 1.4      | 0.46   | 430    | 0.00                  | 6.5    | 4.83E-03     | 3    | 5.18E-03                       | 1    |
| Infil & TCLP     | 90209  | 2.6   | 2635.71        | 0.084  | 1.2                       | 14.29    | 4.1      | 0.46   | 430    | 117.75                | 6.5    | 1.64E-03     | F    | 3.92E-03                       | 12   |
| Wst. Vol & Zwell | 60705  | 2.6   | 44900          | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 430    | 117.75                | 1.3    | 2.08E-04     | 21   | 3.62E-03                       | 13   |
| Ywell & Zwell    | 60705  | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 65     | 0.00                  | 1.3    | 9.50E-04     | 17   | 2.56E-03                       | 14   |
| Area & Xwell     | 420888 | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 102    | 217.62                | 6.5    | 5.61E-03     | 2    | 2.40E-03                       | 15   |
| infil & Zwell    | 90209  | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 4.1      | 0.46   | 430    | 117.75                | .3     | 4.84E-04     | 19   | 1.75E-03                       | 16   |
| TCLP & Zwell     | 60705  | 2.6   | 2635.71        | 0.084  | 1.2                       | 14.29    | 1.4      | 0.17   | 430    | 117.75                | 1.3    | 2.77E-04     | 82   | 1.62E-03                       | 17   |
| Area & TCLP      | 420888 | 2.6   | 2635.71        | 0.084  | 1.2                       | 14.29    | 1.4      | 0.17   | 430    | 238.82                | 6.5    | 3.17E-03     | 9    | 1.43E-03                       | 18   |
| Area & Ywell     | 420888 | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 3.24E-03     | 4    | 1.40E-03                       | 19   |
| Area & Infil     | 420888 | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 4.1      | 0.46   | 8      | 238.82                | 6.5    | 2.61E-03     | 6    | 1.08E-03                       | 82   |
| Area & Zwell     | 420888 | 2.6   | 2635.71        | 0.059  | 1.2                       | 20.34    | 4.       | 0.17   | 430    | 238.82                | 1.3    | 1.27E-03     | 15   | 8.26E-04                       | 21   |
|                  |        |       |                |        |                           |          |          |        |        |                       |        |              |      |                                |      |

Table A.3 Sensitivity Analysis for Contingent Management of CSO Sludge, Off-Site Landfill/Benzene -- Industrial Areas -- 20 Year Active Life

| Г    | Г                               | 녿                 | Γ.        | ]              | Γ               | Г                 | Γ                | Т             | Γ                 | Г               | _              | -                |               |               | T_              |              | _             |                 | Г           | Ι.           | Г              | Γ.                 | Γ.            |               |
|------|---------------------------------|-------------------|-----------|----------------|-----------------|-------------------|------------------|---------------|-------------------|-----------------|----------------|------------------|---------------|---------------|-----------------|--------------|---------------|-----------------|-------------|--------------|----------------|--------------------|---------------|---------------|
|      | L                               | ) Rank            | _         | _              | 2               | <u>د</u>          | 4                | 5             | 9                 | 7               | 8              | 6                | 9             | =             | 12              | 13           | 14            | 15              | 16          | 11           | 18             | 19                 | 2             |               |
| 1998 | 9-year Avg.                     | Rank Conc. (mg/L) | 1.96E-03  | 1.50E-02       | 1.31E-02        | 1.05E-02          | 1.01E-02         | 8.95E-03      | 8.72E-03          | 8.53E-03        | 8.46E-03       | 7.63E-03         | 6.96E-03      | 5.45E-03      | 4.26E-03        | 4.11E-03     | 2.80E-03      | 2.76E-03        | 2.45E-03    | 2.29E-03     | 1.61E-03       | 1.46E-03           | 1.22E-03      | 1.17E-03      |
|      | L                               | Rank              |           | ဖ              | -               | 16                | 4                | 13            | 9                 | 12              | 3              | 14               | 8             | 2             | 18              | =            | 5             | 17              | 7           | 6            | 19             | 21                 | 15            | 20            |
| 1997 | 9-year Avg.                     | Conc. (mg/L)      | 4.77E-04  | 3.05E-03       | 1.55E-02        | 1.08E-03          | 3.22E-03         | 1.44E-03      | 2.16E-03          | 1.53E-03        | 4.81E-03       | 1.34E-03         | 2.86E-03      | 5.34E-03      | 6.99E-04        | 1.63E-03     | 3.08E-03      | 9.47E-04        | 3.02E-03    | 2.47E-03     | 4.81E-04       | 2.08E-04           | 1.21E-03      | 2.75E-04      |
|      | Z-Well                          | Ξ                 | 6.5       | 6.5            | 6.5             | 6.5               | 6.5              | 6.5           | 6.5               | 1.3             | 6.5            | 6.5              | 6.5           | 6.5           | 6.5             | 6.5          | 6.5           | 1.3             | 6.5         | 6.5          | 1.3            | 1.3                | 1.3           | 1.3           |
|      | X-well Y- Well Z-Well           | (E)               | 85.91     | 92.09          | 165.01          | 92.09             | 0.00             | 92.09         | 0.00              | 92.09           | 0.00           | 85.91            | 0.00          | 142.35        | 85.91           | 85.91        | 0.00          | 0.00            | 165.01      | 165.01       | 85.91          | 85.91              | 165.01        | 85.91         |
|      | X-well                          | Ξ                 | 430       | 102            | 430             | 102               | 102              | 102           | 430               | 102             | 430            | 430              | 430           | 102           | 430             | 430          | 430           | 430             | 430         | 430          | 430            | 430                | 430           | 430           |
|      |                                 | (m/yr)            | 0.17      | 0.46           | 0.17            | 0.17              | 0.17             | 0.17          | 0.17              | 0.17            | 0.46           | 0.46             | 0.17          | 0.17          | 0.17            | 0.46         | 0.17          | 0.17            | 0.17        | 0.46         | 0.46           | 0.17               | 0.17          | 0.17          |
|      | Wst. Den                        | (g/cm3)           | 1.4       | 1.4            | 1.4             | 1.4               | 1.4              | 1.4           | 1.4               | 4.1             | 1.4            | 1.4              | 1.4           | 4.1           | 4.1             | 1.4          | 1.4           | 1.4             | 1.4         | 1.4          | 1.4            | 1.4                | 1.4           | 4.1           |
|      | <u> </u>                        | (L/kg)            | 20.34     | 20.34          | 20.34           | 20.34             | 20.34            | 14.29         | 20.34             | 20.34           | 20.34          | 20.34            | 14.29         | 20.34         | 14.29           | 14.29        | 20.34         | 20.34           | 14.29       | 20.34        | 20.34          | 20.34              | 20.34         | 14.29         |
|      | Wst Conc Cw / Cl Wst. Den Infil | (mg/kg)           | 1.2       | 1.2            | 1.2             | 1.2               | 1.2              | 1.2           | 1.2               | 1.2             | 1.2            | 1.2              | 1.2           | 1.2           | 1.2             | 1.2          | 1.2           | 1.2             | 1.2         | 1.2          | 1.2            | 1.2                | 1.2           | 1.2           |
|      | TCLP                            | (mg/L)            | 0.059     | 0.059          | 0.059           | 0.059             | 0.059            | 0.084         | 0.059             | 0.059           | 0.059          | 0.059            | 0.084         | 0.059         | 0.084           | 0.084        | 0.059         | 0.059           | 0.084       | 0.059        | 0.059          | 0.059              | 0.059         | 0.084         |
|      | Wst. Vol                        | (m3)              | 2500      | 2500           | 44900           | 44900             | 2500             | 2500          | 44900             | 2500            | 2500           | 44900            | 2500          | 2500          | 44900           | 2500         | 2500          | 2500            | 2500        | 2500         | 2500           | 44900              | 2500          | 2500          |
|      | Depth                           | (m)               | 5.6       | 2.6            | 2.6             | 2.6               | 2.6              | 5.6           | 2.6               | 5.6             | 5.6            | 5.6              | 5.6           | 5.6           | 2.6             | 5.6          | 2.6           | 2.6             | 2.6         | 5.6          | 2.6            | 2.6                | 2.6           | 5.6           |
|      |                                 | (m2)              | 20200     | 20200          | 162000          | 20200             | 20200            | 20200         | 20200             | 20200           | 20200          | 20200            | 20200         | 162000        | 20200           | 20200        | 162000        | 20200           | 162000      | 162000       | 20200          | 20200              | 162000        | 20200         |
|      | Two-Parameters                  | at High End       | Base Case | X-Well & Infil | Wst. Vol & Area | Wst. Vol & X-Well | X-Well & Y- Well | X-Well & TCLP | Wst. Vol & Y-Well | X-Well & Z-Well | Y-Well & Infil | Wst. Vol & Infil | Y-Well & TCLP | X-Well & Area | Wst. Vol & TCLP | TCLP & Infil | Y-Well & Area | Y-Well & Z-Well | TCLP & Area | Infil & Area | Infil & Z-Well | Wst. Vol. & Z-Well | Area & Z-Well | TCLP & Z-Well |

Table A.4 Sensitivity Analysis for Contingent Management of CSO Sludge, Off-Site Landfill/Benzene -- Municipal Areas -- 20 Year Active Life

| Γ    | Τ  | ž                 | Ι         | Γ                 |                  |                 | T.,               |               |                | T.              | Τ.               | T               | _             | _              | ۵.           | _                  | _               | ,_            |                |               | _           | _             | _            |               |
|------|--|-------------------|-----------|-------------------|------------------|-----------------|-------------------|---------------|----------------|-----------------|------------------|-----------------|---------------|----------------|--------------|--------------------|-----------------|---------------|----------------|---------------|-------------|---------------|--------------|---------------|
|      | L  | .) Rank           |           |                   | 2                | 3               | 4                 | 5             | 9              | _               | 8                | 6               | 10            | Ξ              | 12           | 13                 | 14              | 15            | 16             | 17            | 18          | 19            | 8            | 21            |
| 1998 | 9-year Avg.                                      | Rank Conc. (mg/L) | 2.79E-03  | 2.15E-02          | 1.59E-02         | 1.41E-02        | 1.31E-02          | 1.02E-02      | 1.02E-02       | 1.00E-02        | 9.92E-03         | 8.44E-03        | 5.52E-03      | 4.93E-03       | 3.74E-03     | 3.62E-03           | 2.47E-03        | 2.28E-03      | 1.66E-03       | 1.55E-03      | 1.36E-03    | 1.33E-03      | 1.03E-03     | 7.84E-04      |
|      | L  | Rank              |           | 16                | 4                | -               | 2                 | 13            | 9              | 18              | 4                | 12              | æ             | 3              | =            | 21                 | 17              | 2             | 19             | 20            | 7           | 2             | တ            | 15            |
| 1997 | 9-year Avg.                                      | Conc. (mg/L)      | 4.77E-04  | 1.08E-03          | 1.34E-03         | 1.55E-02        | 2.16E-03          | 1.44E-03      | 3.05E-03       | 6.99E-04        | 3.22E-03         | 1.53E-03        | 2.86E-03      | 4.81E-03       | 1.63E-03     | 2.08E-04           | 9.47E-04        | 5.34E-03      | 4.81E-04       | 2.75E-04      | 3.02E-03    | 3.08E-03      | 2.47E-03     | 1.21E-03      |
|      | Z-Well   | (E)               | 6.5       | 6.5               | 6.5              | 6.5             | 6.5               | 6.5           | 6.5            | 6.5             | 6.5              | 1.3             | 6.5           | 6.5            | 6.5          | 5.5                | 1.3             | 6.5           | 1.3            | 1.3           | 6.5         | 6.5           | 6.5          | 1.3           |
| 3, 1 | X-well Y- Well Z-Well                            | (m)               | 117.75    | 93.79             | 117.75           | 238.82          | 0.00              | 93.79         | 93.79          | 117.75          | 0.00             | 93.79           | 0.00          | 0.00           | 117.75       | 117.75             | 0.00            | 217.62        | 117.75         | 117.75        | 238.82      | 0.00          | 238.82       | 238.82        |
|      | X-well   | (m)               | 430       | 102               | 430              | 430             | 430               | 102           | 102            | 430             | 102              | 102             | 430           | 430            | 430          | 430                | 430             | 102           | 430            | 430           | 430         | 430           | 430          | 430           |
|      |  | (m/yr)            | 0.17      | 0.17              | 0.46             | 0.17            | 0.17              | 0.17          | 0.46           | 0.17            | 0.17             | 0.17            | 0.17          | 0.46           | 0.46         | 0.17               | 0.17            | 0.17          | 0.46           | 0.17          | 0.17        | 0.17          | 0.46         | 0.17          |
|      | Wst. Den   | (g/cm3)           | 1.4       | 4.4               | 4.1              | 4,1             | 4.1               | 4.1           | 1.4            | 1.4             | 1.4              | 4.1             | 4.1           | 1.4            | 4.1          | 1.4                | 1.4             | 1.4           | 1.4            | 4.1           | 1.4         | 1.4           | 1.4          | 1.4           |
|      | <u>i</u>   | (L/kg)            | 20.34     | 20.34             | 20.34            | 20.34           | 20.34             | 14.29         | 20.34          | 14.29           | 20.34            | 20.34           | 14.29         | 20.34          | 14.29        | 20.34              | 20.34           | 20.34         | 20.34          | 14.29         | 14.29       | 20.34         | 20.34        | 20.34         |
|      | th Wst. Vol TCLP Wst Conc Cw / Cl Wst. Den Infil | (mg/kg)           | 1.2       | 1.2               | 1.2              | 1.2             | 1.2               | 1.2           | 1.2            | 1.2             | 1.2              | 1.2             | 1.2           | 1.2            | 1.2          | 1.2                | 1.2             | 1.2           | 1.2            | 1.2           | 1.2         | 1.2           | 1.2          | 1.2           |
|      | TCLP   | (mg/L)            | 0.059     | 0.059             | 0.059            | 0.059           | 0.059             | 0.084         | 0.059          | 0.084           | 0.059            | 0.059           | 0.084         | 0.059          | 0.084        | 0.059              | 0.059           | 0.059         | 0.059          | 0.084         | 0.084       | 0.059         | 0.059        | 0.059         |
|      | Wst. Vol   | (m3)              | 2500      | 44900             | 44900            | 44900           | 44900             | 2500          | 2500           | 44900           | 2500             | 2500            | 2500          | 2500           | 2500         | 44900              | 2500            | 2500          | 2500           | 2500          | 2500        | 2500          | 2500         | 2500          |
|      | Depth  | (m)               | 2.6       | 2.6               | 2.6              | 2.6             | 2.6               | 2.6           | 5.6            | 2.6             | 5.6              | 2.6             | 2.6           | 5.6            | 2.6          | 2.6                | 2.6             | 2.6           | 2.6            | 5.6           | 2.6         | 2.6           | 2.6          | 2.6           |
|      | Area   | (m2)              | 60705     | 60209             | 60709            | 420888          | 60705             | 60705         | 60705          | 60705           | 60705            | 60705           | 60705         | 60705          | 60705        | 60705              | 60705           | 420888        | 60705          | 60705         | 420888      | 420888        | 420888       | 420888        |
|      | Two-Parameters                                   | at High End       | Base Case | Wst. Vol & X-Well | Wst. Vol & Infil | Wst. Vol & Area | Wst. Vol & Y-Well | X-Well & TCLP | X-Well & Infil | Wst. Vof & TCLP | X-Well & Y- Well | X-Well & Z-Well | Y-Well & TCLP | Y-Well & Infil | TCLP & Infil | Wst. Vol. & Z-Well | Y-Well & Z-Well | X-Well & Area | Infil & Z-Well | TCLP & Z-Well | TCLP & Area | Y-Well & Area | Infil & Area | Area & Z-Well |

Table A.5 Sensitivity Analysis for Crude Oil tank sediment Off-Site Landfill /Benzene -- Industrial Landfills -- 20 Year Active Life

|                      |        |       |          |        |          |         |          |        |          |                       |        | 1997         |      | 1998         | •    |
|----------------------|--------|-------|----------|--------|----------|---------|----------|--------|----------|-----------------------|--------|--------------|------|--------------|------|
| Two-Parameters       | Area   | Depth | Wst. Vol | TCLP   | Wst Conc | Cw / Cl | Wst. Den | III    | X-well   | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |      | 9-year Avg.  |      |
| at High End          | (m2)   | Œ     | (m3)     | (mg/L) | (mg/kg)  | (L/kg)  | (g/cm3)  | (m/yr) | <b>E</b> | (E)                   | (E)    | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case            | 20200  | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | &<br>8   | 85.91                 | 6.5    | 5.12E-03     |      | 2.11E-02     |      |
| Infil & Xwell        | 20200  | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 102      | 60.76                 | 6.5    | 3.32E-02     | 8    | 1.57E-01     | -    |
| Area & Wst. Vol      | 162000 | 2.6   | 8315.8   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430      | 165.01                | 6.5    | 1.71E-01     | +    | 1.44E-01     | 2    |
| TCLP & xwell         | 20200  | 2.6   | 457.24   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 102      | 60.76                 | 6.5    | 2.59E-02     | 12   | 1.26E-01     | က    |
| Xwell & Wst Vol      | 20200  | 2.6   | 8315.8   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 102      | 92.09                 | 6.5    | 1.20E-02     | 8    | 1.17E-01     | 4    |
| Ywell & Xwell        | 20200  | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 102      | 0.00                  | 6.5    | 3.44E-02     | 7    | 1.10E-01     | 5    |
| Xwell & Wst. Conc    | 20200  | 2.6   | 457.24   | 0.679  | 220      | 324.01  | 1.52     | 0.17   | 102      | 60.76                 | 6.5    | 1.16E-02     | 22   | 1.04E-01     | 9    |
| Ywell & Wst. Vol     | 20200  | 2.6   | 8315.8   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430      | 0.00                  | 6.5    | 2.40E-02     | 4    | 9.75E-02     | 7    |
| Ywell & TCLP         | 20200  | 2.6   | 457.24   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 430      | 0.00                  | 6.5    | 5.11E-02     | 9    | 9.49E-02     | 8    |
| Xwell & Zwell        | 20200  | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 102      | 60.76                 | 1.3    | 1.64E-02     | 16   | 9.18E-02     | 6    |
| Ywell & Infil        | 20200  | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 430      | 0.00                  | 6.5    | 5.24E-02     | 4    | 8.79E-02     | 5    |
| Ywell & Wst Conc     | 20200  | 2.6   | 457.24   | 0.679  | 220      | 324.01  | 1.52     | 0.17   | 430      | 0.00                  | 6.5    | 2.33E-02     | 15   | 8.51E-02     | 11   |
| Infil & Wst. Vol     | 20200  | 2.6   | 8315.8   | 6/9.0  | 58.72    | 86.48   | 1.52     | 0.46   | 430      | 85.91                 | 6.5    | 5.85E-02     | က    | 8.46E-02     | 12   |
| TCLP & Wst. Vol      | 20200  | 2.6   | 8315.8   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 430      | 85.91                 | 6.5    | 1.30E-02     | 19   | 7.83E-02     | 13   |
| Area & Wst. Conc     | 162000 | 2.6   | 457.24   | 6/9.0  | 220      | 324.01  | 1.52     | 0.17   | 430      | 165.01                | 6.5    | 8.02E-02     | 2    | 7.33E-02     | 14   |
| Infil & Wst. Conc    | 20200  | 2.6   | 457.24   | 0.679  | 220      | 324.01  | 1.52     | 0.46   | 430      | 85.91                 | 6.5    | 1.44E-02     | 17   | 6.56E-02     | 15   |
| Area & Xwell         | 162000 | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 102      | 142.35                | 6.5    | 5.18E-02     | 2    | 6.10E-02     | 16   |
| TCLP & Wst Conc      | 20200  | 2.6   | 457.24   | 1.7    | 220      | 129.41  | 1.52     | 0.17   | 430      | 85.91                 | 6.5    | 1.34E-02     | 18   | 6.05E-02     | 17   |
| Infil & TCLP         | 20200  | 2.6   | 457.24   | 1.7    | 58.72    | 34.54   | 1.52     | 0.46   | 430      | 85.91                 | 6.5    | 2.71E-02     | 1    | 4.85E-02     | 18   |
| Area & Ywell         | 162000 | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430      | 0.00                  | 6.5    | 3.00E-02     | 6    | 3.16E-02     | 19   |
| Wst. Vol & Wst. Conc |        | 2.6   | 8315.8   | 6.679  | 220      | 324.01  | 1.52     | 0.17   | 430      | 85.91                 | 6.5    | 5.95E-03     | 24   | 3.01E-02     | 20   |
| Ywell & Zwell        | 20200  | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430      | 0.00                  | 1.3    | 1.02E-02     | 23   | 2.97E-02     | 21   |
| Area & TCLP          | 162000 | 2.6   | 457.24   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 430      | 165.01                | 6.5    | 2.85E-02     | 10   | 2.70E-02     | 22   |
| Area & Infil         | 162000 | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 430      | 165.01                | 6.5    | 2.44E-02     | 13   | 2.63E-02     | 23   |
| Infil & Zwell        | 20200  | 2.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 430      | 85.91                 | 1.3    | 5.24E-03     | 25   | 1:68E-02     | 24   |
| Wst. Vol & Zwell     | 20200  | 2.6   | 8315.8   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430      | 85.91                 | 1.3    | 2.31E-03     | 27   | 1.63E-02     | 25   |
| TCLP & Zwell         | 20200  | 2.6   | 457.24   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 430      | 85.91                 | 1.3    | 4.91E-03     | 26   | 1.59E-02     | 26   |
| Wst Conc & Zwell     | 20200  | 2.6   | 457.24   | 0.679  | 220      | 324.01  | 1.52     | 0.17   | 430      | 85.91                 | 1.3    | 2.22E-03     | 28   | 1.43E-02     | 27   |
| Area & Zwell         | 162000 | 5.6   | 457.24   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430      | 165.01                | 1.3    | 1.17E-02     | 21   | 1.37E-02     | 28   |

Table A.6 Sensitivity Analysis for Crude Oil tank sediment Off-Site Landfill /TC Capped Benzene -- Industrial Areas -- 20 Year Active Life

| ,                 | ,      |       |          |        |          |             |                | -      |        |                       |        | 1997                           |      | 1998         |      |
|-------------------|--------|-------|----------|--------|----------|-------------|----------------|--------|--------|-----------------------|--------|--------------------------------|------|--------------|------|
| Two-Parameters    | Area   | Depth | Wst. Vol | TCLP   | Wst Conc | ਹ<br>}<br>} | Wst. Den       | Infil  | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.                    |      | 9-year Avg.  |      |
| at High End       | (m2)   | Œ     | (m3)     | (mg/L) | (mg/kg)  | (L/kg)      | (g/cm3) (m/yr) | (m/yr) | Ê      | Ê                     | Œ      | Conc. (mg/L) Rank Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case         | 20200  | 2.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 430    | 85.91                 | 6.5    | 3.94E-03                       |      | 1.73E-02     |      |
| Infil & Xwell     | 20200  | 2.6   | 457.24   | 9.0    | 58.72    | 117.44      | 1.52           | 0.46   | 102    | 92.09                 | 6.5    | 2.56E-02                       | 8    | 1.35E-01     | 9    |
| Area & Wst. Vol   | 162000 | 2.6   | 8315.80  | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 430    | 165.01                | 6.5    | 1.34E-01                       | -    | 1.14E-01     | 4    |
| Ywell & Xwell     | 20200  | 2.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 102    | 9.0                   | 6.5    | 2.67E-02                       | 7    | 8.91E-02     | 6    |
| Xwell & Wst Vol   | 20200  | 2.6   | 8315.80  | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 102    | 60.76                 | 6.5    | 9.07E-03                       | 18   | 8.65E-02     | -    |
| Xwell & Wst. Conc | 20200  | 2.6   | 457.24   | 0.5    | 220      | 440.00      | 1.52           | 0.17   | 102    | 92.09                 | 6.5    | 8.65E-03                       | 19   | 7.93E-02     | က    |
| Ywell & Infil     | 20200  | 2.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.48   | 430    | 0.00                  | 6.5    | 4.04E-02                       | 4    | 7.66E-02     | 4    |
| Xwell & Zwell     | 20200  | 2.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 102    | 60.76                 | 1.3    | 1.27E-02                       | 13   | 7.47E-02     | 1    |
| Ywell & Wst. Vol  | 20200  | 2.6   | 8315.80  | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 430    | 0.00                  | 6.5    | 1.81E-02                       | 5    | 7.14E-02     | 5    |
| Ywell & Wst Conc  | 20200  | 2.6   | 457.24   | 0.5    | 220      | 440.00      | 1.52           | 0.17   | 430    | 0.00                  | 6.5    | 1.74E-02                       | Ξ    | 6.54E-02     | 10   |
| Area & Wst. Conc  | 162000 | 2.6   | 457.24   | 0.5    | 220      | 440.00      | 1.52           | 0.17   | 430    | 165.01                | 6.5    | 7.14E-02                       | 2    | 6.45E-02     | 12   |
| nfil & Wst. Vol   | 20200  | 5.6   | 8315.80  | 0.5    | 58.72    | 117.44      | 1.52           | 0.46   | 82     | 85.91                 | 6.5    | 1.06E-02                       | 16   | 6.36E-02     | 2    |
| Area & Xwell      | 162000 | 5.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 102    | 142.35                | 6.5    | 4.94E-02                       | 8    | 5.86E-02     | 13   |
| Sonc              | 20200  | 2.6   | 457.24   | 0.5    | 220      | 440.00      | 1.52           | 0.46   | 430    | 85.91                 | 6.5    | 1.07E-02                       | 15   | 5.22E-02     | 7    |
| -                 | 162000 | 2.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 430    | 0.00                  | 6.5    | 2.92E-02                       | 2    | 3.06E-02     | 17   |
|                   | 162000 | 2.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.46   | 430    | 165.01                | 6.5    | 2.41E-02                       | 6    | 2.59E-02     | 18   |
| Vst. Conc         |        | 2.6   | 8315.80  | 0.5    | 220      | 440.00      | 1.52           | 0.17   | 430    | 85.91                 | 6.5    | 4.41E-03                       | 22   | 2.47E-02     | 8    |
| - To              | 20200  | 2.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 430    | 0.00                  | £.     | 7.81E-03                       | 21   | 2.44E-02     | 19   |
|                   | 20200  | 5.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.46   | 430    | 85.91                 | £.     | 4.04E-03                       | 22   | 1.46E-02     | 8    |
| Area & Zwell      | 162000 | 2.6   | 457.24   | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 430    | 165.01                | 1.3    | 1.14E-02                       | 4    | 1.33E-02     | 21   |
|                   | 20200  | 5.6   | 8315.80  | 0.5    | 58.72    | 117.44      | 1.52           | 0.17   | 430    | 85.91                 | £.     | 1.74E-03                       | 92   | 1.20E-02     | 15   |
| Wst Conc & Zwell  | 20200  | 2.6   | 457.24   | 0.5    | 220      | 440.00      | 1.52           | 0.17   | 430    | 85.91                 | 1.3    | 1.67E-03                       | 27   | 1.10E-02     | 19   |

Table A.7 Sensitivity Analysis for Crude Oil tank sediment Off-Site Landfill /Benzene -- Municipal Areas -- 20 Year Active Life

| _    |                       |                | r         | <del>,</del>    |                   | ,               |                  | ,               |                  |              | ,             |                  |               |                   |                 | ,             |                      |              | <del>,</del>  | ,                |              | ,                |                  | ,            |               |               | ,            |              | ····        | ,        | ,            |
|------|-----------------------|----------------|-----------|-----------------|-------------------|-----------------|------------------|-----------------|------------------|--------------|---------------|------------------|---------------|-------------------|-----------------|---------------|----------------------|--------------|---------------|------------------|--------------|------------------|------------------|--------------|---------------|---------------|--------------|--------------|-------------|----------|--------------|
|      |                       | Rank           |           | -               | 2                 | 3               | 4                | 5               | 9                | 7            | 80            | 6                | 9             | 11                | 12              | 13            | 14                   | 15           | 16            | 17               | 18           | 19               | 20               | 21           | 22            | 23            | 24           | 25           | 26          | 27       | 28           |
| 1998 | 9-year Avg.           | Conc. (mg/L)   | 2.93E-02  | 2.38E-01        | 1.78E-01          | 1.75E-01        | 1.75E-01         | 1.50E-01        | 1.45E-01         | 1.18E-01     | 1.11E-01      | 1.04E-01         | 1.04E-01      | 9.97E-02          | 9.48E-02        | 8.80E-02      | 8.79E-02             | 6.28E-02     | 5.47E-02      | 5.15E-02         | 4.12E-02     | 4.00E-02         | 2.88E-02         | 2.61E-02     | 2.59E-02      | 1.84E-02      | 1.76E-02     | 1.53E-02     | 1.49E-02    | 1.18E-02 | 9.01E-03     |
|      |                       | Rank           |           | 20              | 22                | 19              | က                | -               | 4                | 12           | 80            | 15               | 7             | 11                | 18              | 16            | 24                   | 9            | 4             | 2                | =            | 27               | 88               | 2            | 23            | 25            | 56           | 6            | 9           | 13       | 21           |
| 1997 | 9-year Avg.           | Conc. (mg/L)   | 5.12E-03  | 1.20E-02        | 1.16E-02          | 1.30E-02        | 5.85E-02         | 1.71E-01        | 2.40E-02         | 2.59E-02     | 3.32E-02      | 2.33E-02         | 3.44E-02      | 1.44E-02          | 1.34E-02        | 1.64E-02      | 5.95E-03             | 5.11E-02     | 5.24E-02      | 8.02E-02         | 2.71E-02     | 2.31E-03         | 2.22E-03         | 5.18E-02     | 1.02E-02      | 5.24E-03      | 4.91E-03     | 3.00E-02     | 2.85E-02    | 2.44E-02 | 1.17E-02     |
|      | Z-Well                | Œ              | 6.5       | 6.5             | 6.5               | 6.5             | 6.5              | 6.5             | 6.5              | 6.5          | 6.5           | 6.5              | 6.5           | 6.5               | 6.5             | 1.3           | 6.5                  | 6.5          | 6.5           | 6.5              | 6.5          | 1.3              | 1.3              | 6.5          | 1.3           | 1.3           | 1.3          | 6.5          | 6.5         | 6.5      | 1.3          |
|      | X-well Y- Well Z-Well | (ω)            | 117.75    | 93.79           | 93.79             | 117.75          | 117.75           | 238.82          | 0.00             | 93.79        | 93.79         | 0.00             | 0.00          | 117.75            | 117.75          | 93.79         | 117.75               | 0.00         | 0.00          | 238.82           | 117.75       | 117.75           | 117.75           | 217.62       | 0.00          | 117.75        | 117.75       | 0.00         | 238.82      | 238.82   | 238.82       |
|      | X-well                | (E)            | 430       | 102             | 102               | 430             | 430              | 430             | 430              | 102          | 102           | 430              | 102           | 430               | 430             | 102           | 430                  | 430          | 430           | 430              | 430          | 430              | 430              | 102          | 430           | 430           | 430          | 430          | 430         | 430      | 430          |
|      | Infil                 | (m/yr)         | 0.17      | 0.17            | 0.17              | 0.17            | 0.46             | 0.17            | 0.17             | 0.17         | 0.46          | 0.17             | 0.17          | 0.46              | 0.17            | 0.17          | 0.17                 | 0.17         | 0.46          | 0.17             | 0.46         | 0.17             | 0.17             | 0.17         | 0.17          | 0.46          | 0.17         | 0.17         | 0.17        | 0.46     | 0.17         |
|      | Wst. Den              | (g/cm3) (m/yr) | 1.52      | 1.52            | 1.52              | 1.52            | 1.52             | ् 1.52          | 1.52             | 1.52         | 1.52          | 1.52             | 1.52          | 1.52              | 1.52            | 1.52          | 1.52                 | 1.52         | 1.52          | 1.52             | 1.52         | 1.52             | 1.52             | 1.52         | 1.52          | 1.52          | 1.52         | 1.52         | 1.52        | 1.52     | 1.52         |
|      | Cw / Cl               | (L/kg)         | 86.48     | 86.48           | 324.01            | 34.54           | 86.48            | 86.48           | 86.48            | 34.54        | 86.48         | 324.01           | 86.48         | 324.01            | 129.41          | 86.48         | 324.01               | 34.54        | 86.48         | 324.01           | 34.54        | 86.48            | 324.01           | 86.48        | 86.48         | 86.48         | 34.54        | 86.48        | 34.54       | 86.48    | 86.48        |
|      | Wst Conc              | (mg/kg)        | 58.72     | 58.72           | 220               | 58.72           | 58.72            | 58.72           | 58.72            | 58.72        | 58.72         | 220              | 58.72         | 220               | 220             | 58.72         | 220                  | 58.72        | 58.72         | 220              | 58.72        | 58.72            | 220              | 58.72        | 58.72         | 58.72         | 58.72        | 58.72        | 58.72       | 58.72    | 58.72        |
|      | TCLP                  | (mg/L)         | 0.679     | 0.679           | 0.679             | 1,7             | 0.679            | 0.679           | 0.679            | 1.7          | 0.679         | 0.679            | 0.679         | 0.679             | 1.7             | 0.679         | 0.679                | 1.7          | 0.679         | 0.679            | 1.7          | 0.679            | 0.679            | 0.679        | 0.679         | 6/9.0         | 1.7          | 0.679        | 1.7         | 0.679    | 0.679        |
|      | Wst. Vol              | (m3)           | 457.24    | 8315.8          | 457.24            | 8315.8          | 8315.8           | 8315.8          | 8315.8           | 457.24       | 457.24        | 457.24           | 457.24        | 457.24            | 457.24          | 457.24        | 8315.8               | 457.24       | 457.24        | 457.24           | 457.24       | 8315.8           | 457.24           | 457.24       | 457.24        | 457.24        | 457.24       | 457.24       | 457.24      | 457.24   | 457.24       |
|      | Depth                 | (m)            | 2.6       | 2.6             | 2.6               | 2.6             | 2.6              | 2.6             | 2.6              | 2.6          | 2.6           | 2.6              | 2.6           | 2.6               | 2.6             | 2.6           | 2.6                  | 2.6          | 2.6           | 2.6              | 2.6          | 2.6              | 2.6              | 2.6          | 2.6           | 2.6           | 5.6          | 2.6          | 2.6         | 2.6      | 2.6          |
|      | Area                  | (m2)           | 60705     | 60705           | 60709             | 60705           | 60705            | 420888          | 60705            | 60705        | 60705         | 60705            | 60709         | 60705             | 60709           | 60709         | 60705                | 60705        | 60705         | 420888           | 60705        | 60705            | 60709            | 420888       | 60705         | 60705         | 60705        | 420888       | 420888      | 420888   | 420888       |
|      | Two-Parameters        | at High End    | Base Case | Xwell & Wst Vol | Xwell & Wst. Conc | TCLP & Wst. Vol | Infil & Wst. Vol | Area & Wst. Vol | Ywell & Wst. Vol | TCLP & xwell | Infil & Xwell | Ywell & Wst Conc | Ywell & Xwell | Infil & Wst. Conc | TCLP & Wst Conc | Xwell & Zwell | Wst. Vol & Wst. Conc | Ywell & TCLP | Ywell & Infil | Area & Wst. Conc | Infil & TCLP | Wst. Vol & Zwell | Wst Conc & Zwell | Area & Xwell | Ywell & Zwell | Infil & Zwell | TCLP & Zwell | Area & Ywell | Area & TCLP |          | Area & Zwell |

Table A.8 Sensitivity Analysis for Crude Oil tank sediment Off-Site Landfill /TC Capped Benzene -- Municipal Areas -- 20 Year Active Life

|                    |        |         |                |        |          |        |          |        |        | ,                     |                | 1997         |          | 9000         |      |
|--------------------|--------|---------|----------------|--------|----------|--------|----------|--------|--------|-----------------------|----------------|--------------|----------|--------------|------|
| Two-Parameters     | Area   | Depth   | Depth Wst. Vol | TCL P  | Wet Conc | 2      | West Day |        | ,      |                       | :              |              |          | 1990         |      |
| at High End        | (m)    | (       | , E            |        |          | ; ;    | -        |        | Y-Well | A-well Y- Well Z-Well | Z-Well         | 9-year Avg.  |          | 9-year Avg.  |      |
|                    | (3)    | 4       | (6111)         | (mg/L) | (mg/kg)  | (L/kg) | (g/cm3)  | (m/yr) | Ê      | Ξ                     | Œ              | Conc. (mg/L) | Rank     | Conc. (ma/L) | Rank |
| base case          | 60705  | 2.6     | 457.2          | 0.5    | 58.72    | 117.44 | 1.52     | 0.17   | 65     | 117.75                | 6.5            | 3 94F-03     |          | 2 EAE 02     |      |
| Xwell & Wst Vol    | 60705  | 5.6     | 8315.8         | 0.5    | 58.72    | 117.44 | 1.52     | 0.17   | 102    | 03 70                 | S.F.           | 0 075 00     | Ş        | 2.04E-02     |      |
| Xwell & Wst. Conc  | 60705  | 2.6     | 457.2          | 0.5    | 220      | 440.00 | 1 53     | 14.0   | : 5    | 2 6                   | 3              | 3.07E-03     | ٥        | 1./8E-01     | -    |
| Infil & Wst. Vol   | 60705  | $\perp$ | 8315.8         | 0.5    | 58 72    | 447 44 | 20.1     | 2 3    | 701    | 82.78                 | 0.0            | 8.65E-03     | 19       | 1.43E-01     | 2    |
| Area & Wet Vol     | 42000  | ┵       | 27.00          | 3      | 20.42    | 1.4    | 1.52     | 0.46   | 430    | 117.75                | 6.5            | 1.06E-02     | 16       | 1.37E-01     | 3    |
| Vivol 9 18/24 1/21 | 420000 |         | 8315.8         | 0.5    | 58.72    | 117.44 | 1.52     | 0.17   | 430    | 238.82                | 6.5            | 1.34E-01     | -        | 1.27E-01     | 4    |
| I Well & WST. VOI  | 90/09  | 2.6     | 8315.8         | 0.5    | 58.72    | 117.44 | 1.52     | 0.17   | 430    | 0.00                  | 6.5            | 1.81E-02     | \$       | 1 10E-01     | . 4  |
| infil & Xwell      | 60705  | 2.6     | 457.2          | 0.5    | 58.72    | 117.44 | 1.52     | 0.46   | 102    | 93 79                 | 6.5            | 2 56E 02     | 2 0      | 1.000        | ,    |
| Ywell & Xwell      | 60705  | 2.6     | 457.2          | 0.5    | 58.72    | 117.44 | 1.52     | 0.17   | 102    | 000                   | 8.5            | 20 202.02    | 2 1      | 1.03E-01     | ا ه  |
| Infil & Wst. Conc  | 60705  | 2.6     | 457.2          | 0.5    | 220      | 440.00 | 1.52     | 0.46   | 430    | 117.75                | 8 6            | 1 07E-02     | ,<br>1E  | 9.19E-02     | \    |
| Ywell & Wst Conc   | 60705  | 2.6     | 457.2          | 0.5    | 220      | 440.00 | 1.52     | 0.17   | 430    | 000                   | 8.5            | 1 2AE 02     | 2 7      | 0.30E-UZ     | ρ    |
| Xwell & Zwell      | 60705  | 2.6     | 457.2          | 0.5    | 58 72    | 117 44 | 1 53     | 147    | 3 5    |                       | 3              | 1.74E-02     | =        | 8.44E-02     | 6    |
| Wat Vol & Wet Conc | 8070E  | 36      | 0245.0         | 2.0    | 7 000    | F .    | 36.1     | 2      | 72     | 93.79                 | 1.3            | 1.27E-02     | <u>ლ</u> | 7.80E-02     | 5    |
| Vivol 6 feet       | 3 3    | 2.0     | 05.00          | ი<br>ი | 7.20     | 440.00 | 1.52     | 0.17   | 430    | 117.75                | 6.5            | 4.41E-03     | 22       | 6.37E-02     | 1    |
| Twell & Inili      | 60705  | 2.6     | 457.2          | 0.5    | 58.72    | 117.44 | 1.52     | 0.46   | 430    | 0.00                  | 6.5            | 4.04E-02     | ₽        | 5 20E 02     | : 5  |
| Area & Wst. Conc   | 420888 | 2.6     | 457.2          | 0.5    | 220      | 440.00 | 1.52     | 0.17   | 430    | 238.82                | A.A.           | 7 445 00     | ,        | 3.20E-02     | ַוַ  |
| Wst. Vol & Zwell   | 60705  | 2.6     | 8315.8         | 0.5    | 58.72    | 117 44 | 1.52     | 112    |        | 117.75                | 3              | 1.14E-02     | 7        | 4.89E-02     | 13   |
| Area & Xwell       | 420888 | 2.6     | 457.2          | 5.0    | 58 72    | 117.44 | 1.36     | 7,7    | -+     | 0,17                  | 2:             | 1./4E-03     | 92       | 3.03E-02     | 14   |
| Wst Conc & Zwell   | 8070E  | 36      | 457.0          | 2 0    | 7,75     | F      | 70.1     | 7      | -1     | 79.717                | 6.5            | 4.94E-02     | က        | 2.59E-02     | 15   |
| Vinell 9 Parell    | 20.00  | 2 (     | 7.10           | 2      | 077      | 440.00 | 1.52     | 0.17   | 62     | 117.75                | 6.             | 1.67E-03     | 27       | 2.34E-02     | 16   |
| r well & Zwell     | cn/09  | 5.6     | 457.2          | 0.5    | 58.72    | 117.44 | 1.52     | 0.17   | 430    | 0.00                  | 1.3            | 7.81E-03     | 7        | 2 33E-02     | 17   |
| Infil & Zwell      | 60705  | 5.6     | 457.2          | 0.5    | 58.72    | 117.44 | 1.52     | 0.46   | 430    | 117.75                | 13             | 4 04F-03     | 25       | 1 76E 02     | -    |
| Area & Ywell       | 420888 | 2.6     | 457.2          | 0.5    | 58.72    | 117.44 | 1.52     | 0 17   | 十      | 9                     | 2 2            | 2021         | 5,       | 1.7 35-02    | 2    |
| Area & Infil       | 420888 | 2.6     | 457.2          | 20     | 58 77    | 117 44 | 十        | 4      | +      | 3                     | 2 6            | Z0-3ZE-0Z    | ٥        | 1.51E-02     | 19   |
| Area & Zwell       | 420888 | 26      | 457.9          | 3 6    | 20.72    | F      | +        | 4      |        | 79.97                 | 0.0            | 2.41E-02     | တ        | 1.17E-02     | 20   |
|                    | 2      | 3       | 77,72          | 23     | 20.00    | 17.44  | 1.52     | 0.17   | 430    | 238.82                | <del>د</del> . | 1.14E-02     | 14       | 8.92E-03     | 24   |

Table A.9 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene - Industrial Areas -- 20 Year Active Life

|                     |        |       |          |        |                           |                  |          |        |        |         | -      | 1997         |      | 1998         |      |
|---------------------|--------|-------|----------|--------|---------------------------|------------------|----------|--------|--------|---------|--------|--------------|------|--------------|------|
| Two Parameters      | Area   | Depth | Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | <u>C</u> √ C C C | Wst. Den | Infil  | X-well | Y- Well | Z-Well | 9-year Avg.  |      | 9-year Avg.  | 1997 |
| at High End         | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg)                   | (L/kg)           | (g/cm3)  | (m/yr) | Œ      | Œ)      | Œ      | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case           | 20200  | 2.6   | 476      | 7.9    | 116.38                    | 14.73            | 0.84     | 0.17   | 430    | 85.91   | 6.5    | 3.96E-02     |      | 4.99E-02     |      |
| Wst. Conc. & X-Well | 20200  | 2.6   | 476      | 7.9    | 200                       | 63.29            | 0.84     | 0.17   | 102    | 60.76   | 6.5    | 1.21E-01     | 15   | 6.02E-01     | -    |
| Wst. Vol & X-Well   | 20200  | 2.6   | 1842.9   | 7.9    | 116.38                    | 14.73            | 0.84     | 0.17   | 102    | 60.76   | 6.5    | 1.21E-01     | 16   | 5.66E-01     | 2    |
| Wst. Conc. & Y-Well | 20200  | 2.6   | 476      | 6.7    | 200                       | 63.29            | 0.84     | 0.17   | 430    | 0.00    | 6.5    | 2.39E-01     | 4    | 4.55E-01     | 3    |
| Wst. Vol & Y- Well  | 20200  | 2.6   | 1842.9   | 6.7    | 116.38                    | 14.73            | 0.84     | 0.17   | 430    | 0.00    | 6.5    | 2.37E-01     | 5    | 4.26E-01     | 4    |
| Wst. Vol & Wst Conc | 20200  | 2.6   | 1842.9   | 6.7    | 200                       | 63.29            | 0.84     | 0.17   | 430    | 85.91   | 6.5    | 5.97E-02     | 20   | 2.86E-01     | 5    |
| X-Well & Y- Well    | 20200  | 2.6   | 476      | 7.9    | 116.38                    | 14.73            | 0.84     | 0.17   | 102    | 0.00    | 6.5    | 2.79E-01     | 6    | 2.85E-01     | 9    |
| X-Well & Infil      | 20200  | 2.6   | 476      | 6.7    | 116.38                    | 14.73            | 0.84     | 0.46   | 102    | 92.09   | 6.5    | 2.02E-01     | 9    | 2.77E-01     | 7    |
| X-Well & Z-Well     | 20200  | 2.6   | 476      | 7.9    | 116.38                    | 14.73            | 0.84     | 0.17   | 102    | 92.09   | 1.3    | 1.33E-01     | 12   | 2.41E-01     | 80   |
| Wst. Conc & Infil   | 20200  | 2.6   | 476      | 6.7    | 200                       | 63.29            | 0.84     | 0.46   | 430    | 85.91   | 6.5    | 1.31E-01     | .13  | 2.35E-01     | 6    |
| Wst. Conc & TCLP    | 20200  | 2.6   | 476      | 39     | 200                       | 12.82            | 0.84     | 0.17   | 430    | 85.91   | 6.5    | 1.84E-01     | 2    | 2.16E-01     | 9    |
| Wst. Vol & Infil    | 20200  | 2.6   | 1842.9   | 7.9    | 116.38                    | 14.73            | 0.84     | 0.46   | 430    | 85.91   | 6.5    | 1.28E-01     | 4    | 2.16E-01     | =    |
| X-Well & TCLP       | 20200  | 2.6   | 476      | 39     | 116.38                    | 2.98             | 0.84     | 0.17   | 102    | 60.76   | 6.5    | 1.83E-01     | 80   | 2.11E-01     | 12   |
| Wst. Vol & TCLP     | 20200  | 2.6   | 1842.9   | 39     | 116.38                    | 2.98             | 0.84     | 0.17   | 430    | 85.91   | 6.5    | 1.76E-01     | 6    | 1.96E-01     | 13   |
| Y-Well & TCLP       | 20200  | 2.6   | 476      | 39     | 116.38                    | 2.98             | 0.84     | 0.17   | 430    | 0.00    | 6.5    | 3.38E-01     | -    | 1.50E-01     | 14   |
| Y-Well & Infil      | 20200  | 2.6   | 476      | 7.9    | 116.38                    | 14.73            | 0.84     | 0.46   | 430    | 0.00    | 6.5    | 3.00E-01     | 2    | 1.45E-01     | 5    |
| æ                   | 162000 | 2.6   | 476      | 6.7    | 200                       | 63.29            | 0.84     | 0.17   | 430    | 165.01  | 6.5    | 1.63E-01     | 2    | 1.33E-01     | 16   |
|                     | 162000 | 2.6   | 1842.9   | 6.7    | 116.38                    | 14.73            | 0.84     | 0.17   | 430    | 165.01  | 6.5    | 1.47E-01     | =    | 1.20E-01     | 11   |
| Wst. Conc & Z-Well  | 20200  | 2.6   | 476      | 6.7    | 200                       | 63.29            | 0.84     | 0.17   | 430    | 85.91   | 1.3    | 2.30E-02     | 56   | 7.64E-02     | 18   |
| X-Well & Area       | 162000 | 2.6   | 476      | 6.7    | 116.38                    | 14.73            | 0.84     | 0.17   | 102    | 142.35  | 6.5    | 7.27E-02     | 19   | 7.44E-02     | 19   |
| Wst. Vo & Z-Well    | 20200  | 2.6   | 1842.9   | 7.9    | 116.38                    | 14.73            | 0.84     | 0.17   | 430    | 85.91   | 1.3    | 2.28E-02     | 27   | 7.16E-02     | 8    |
| Y-Well & Z-Well     | 20200  | 2.6   | 476      | 7.9    | 116.38                    | 14.73            | 0.84     | 0.17   | 430    | 0.00    | 1.3    | 7.96E-02     | 2    | 7.13E-02     | 21   |
| TCLP & Infil        | 20200  | 2.6   | 476      | 39     | 116.38                    | 2.98             | 0.84     | 0.46   | 430    | 85.91   | 6.5    | 1.05E-01     | 12   | 6.14E-02     | 22   |
| a                   | 162000 | 2.6   | 476      | 7.9    | 116.38                    | 14.73            | 0.84     | 0.17   | 430    | 0.00    | 6.5    | 4.17E-02     | 21   | 3.79E-02     | 23   |
| TCLP & Area         | 162000 | 2.6   | 476      | 39     | 116.38                    | 2.98             | 0.84     | 0.17   | 430    | 165.01  | 6.5    | 3.84E-02     | 22   | 3.12E-02     | 24   |
|                     | 162000 | 2.6   | 476      | 7.9    | 116.38                    | 14.73            | 0.84     | 0.46   | 430    | 165.01  | 6.5    | 3.30E-02     | 23   | 3.05E-02     | 22   |
|                     | 20200  | 2.6   | 476      | 6.7    | 116.38                    | 14.73            | 0.84     | 0.46   | 430    | 85.91   | 1.3    | 3.00E-02     | 55   | 2.77E-02     | 58   |
| =                   | 20200  | 2.6   | 476      | 39     | 116.38                    | 2.98             | 0.84     | 0.17   | 430    | 85.91   | 1.3    | 3.24E-02     | 24   | 2.52E-02     | 27   |
| Area & Z-Well       | 162000 | 2.6   | 476      | 7.9    | 116.38                    | 14.73            | 0.84     | 0.17   | 430    | 165.01  | 1.3    | 1.64E-02     | 28   | 1.65E-02     | 82   |
|                     |        |       |          |        |                           |                  |          |        |        |         |        |              |      |              |      |

Table A.10 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene (TCLP=TC Regulatory Level) -- Industrial Areas (20 Year Active Life)

| Ture Bear            | <u> </u> |            |                |        |          |         |          |        |          |                    |           | 1001       | İ    |              |          |
|----------------------|----------|------------|----------------|--------|----------|---------|----------|--------|----------|--------------------|-----------|------------|------|--------------|----------|
| Iwo rarameters       | Area     | Depth      | Depth Wst. Vol | TCLP   | Wst Conc | 5/30    | Wst. Den | Infil  | How-X    | X-well X Well Z We | 7.10/2.11 | /661       |      | 1998         |          |
| at High End          | (m2)     | Ξ          | (m3)           | (mg/L) | (mg/kg)  | (L/kg)  | (a/cm3)  | (m/vr) | (E)      | (w)-               | (m)       |            |      |              |          |
| Base Case            | 20200    | 2.6        | 476            | 0.5    | 116.38   | 232 76  | 780      |        |          |                    | 1111      |            | Kank | Conc. (mg/L) | Rank     |
| X-Well & Infil       | 20200    | 26         | 476            | 0.5    | 116.20   | 200.70  | 000      | 2      | 3        | 85.91              | 6.5       | 4.05E-03   |      | 1.81E-02     |          |
| X-Well & Y- Well     | 20200    | 26         | 476            | 2 6    | 146.30   | 226.70  | 0.84     | 0.46   | 102      | 92.09              | 6.5       | 2.63E-02   | 80   | 1.43E-01     | -        |
| Wst. Conc. & X-Well  | 20200    | 2 8        | 476            | 0.0    | 00.00    | 432.76  | 0.84     | 0.13   | 102      | 0.00               | 6.5       | 2.73E-02   | 7    | 9.25E-02     | 2        |
| Y-Well & Infil       | 20200    | 2 6        | 476            | 0.0    | 2000     | 1000.00 | 0.84     | 0.1    | 102      | 92.09              | 6.5       | 8.60E-03   | 19   | 8.21E-02     | 6        |
| Wst. Vol & X-Well    | 20200    | 2.4<br>8.0 | 48420          | 0.0    | 10.38    | 232.76  | 0.84     | 0.46   | 430      | 0.00               | 6.5       | 4.14E-02   | 4    | 8.17E-02     | 4        |
| X-Well & Z-Well      | 20200    | 2.2        |                | 0 0    | 10.38    | 232.76  | 0.84     | 0.17   | 102      | 92.09              | 6.5       | 8.61E-03   | 15   | 8.14E-02     | 5        |
| Wst. Conc & Area     | 162000   | 2 6        | 0/4            | 0 0    | 10.38    | 232.76  | 0.84     | 0.17   | 102      | 92.09              | 1.3       | 1.30E-02   | 12   | 7.73E-02     | 9        |
| Wet Vol & Area       | 20000    | 0 0        |                | 0.0    | 200      | 1000.00 | 0.84     | 0.17   | 430      | 165.01             | 6.5       | 8.87E-02   | -    | 7 39F-02     | -        |
| ואליני סיים שומש     | 102000   | 7.0        | 1842.9         | 0.5    | 116.38   | 232.76  | 0.84     | 0.17   | 83       | 165.01             | 6.5       | 8 45E-02   | -    | 7 005 00     | -        |
| wst. conc. & Y- Well | 20200    | 2.6        | 476            | 0.5    | 200      | 1000.00 | 0.84     | 0.17   | 430      | 000                | S. F.     | 4 70F 00   | , ;  | 1.02E-02     | 0        |
| Wst. Vol & Y- Well   | 20200    | 2.6        | 1842.9         | 0.5    | 116.38   | 232 78  | 0 84     | 1,1    | 3 6      | 3 3                | 3 6       | 1.72E-02   | 2    | 6.73E-02     | <u> </u> |
| X-Well & Area        | 162000   | 2.6        | 476            | 20     | ╁        | 22 72   | 5 6      |        | 3 3      | 0.00               | 0.5       | 1.72E-02   | 6    | 6.66E-02     | 9        |
| Wst. Conc & Infil    | 20200    | 2.6        | 476            | 0.5    | +        | 4000 00 | +        | 7.0    | 102      | 142.35             | 6.5       | 6.39E-02   | 3    | 6.53E-02     | =        |
| Wst. Vol & Infil     | 20200    | 26         | 1842 0         | 2 0    |          | 2000.00 | $\dashv$ | 0.46   | 8<br>8   | 85.91              | 6.5       | 1.05E-02   | 47   | 5.51E-02     | 12       |
| Y-Well & Area        | 162000   | 26         | 476            | 2 6    | +        | 225.70  | 7        | 0.46   | 88       | 85.91              | 6.5       | 1.07E-02   | 13   | 5.40E-02     | 13       |
| Infil & Area         | 162000   | 2.6        | 476            | 2 4    | -        | 232.70  | 7        | _      | -        | 0.00               | 6.5       | 3.74E-02   | 5    | 3.42E-02     | 4        |
| Y-Well & Z-Well      | 20200    | 2.6        | 476            | 2 0    | +        | 636.70  | 7        | -      |          | 165.01             | 6.5       | 3.18E-02   | 9    | 2.93E-02     | 15       |
| Wst. Vol & Wst Conc  | 20200    | 2 6        | 1842 0         | 2 0    |          | 232.76  | +        |        | $\dashv$ | 0.00               | 1.3       | 8.05E-03   | 17   | 2.54E-02     | 16       |
| Infil & Z-Well       | 20200    | 200        | 476            | 0 0    | +        | 1000.00 |          | _      | 430      | 85.91              | 6.5       | 3.97E-03   | 19   | 2.53E-02     | 11       |
|                      | 162000   | 2 6        | 1,0            | 0.0    | $\dashv$ | 232.76  | $\dashv$ | 0.46   | 430      | 85.91              | 1.3       | 4.15E-03   | 8    | 1.56E-02     | 200      |
| Z-Well               | 20200    | 0.7        | 4/0            | ο   c  |          | 232.76  |          |        |          | 165.01             | 6.1       | 1.46E-02 1 | =    | +            | 19       |
| †                    | 20202    | +          | 0 470          |        | +        | 1000.00 | 7        |        | 430      | 85.91              | 1.3       | 1.65E-03 2 | 21   | 1.13E-02     | 2        |
|                      | 2020     | $\dashv$   | 1047.9         | 0.0    | 116.38   | 232.76  | 0.84     | 0.17   | 430      | 85.91              | 1.3       | 1.66E-03 2 | 200  | 1.12E-02     | 7        |

Table A.11 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene -- Muncipal Areas -- 20 Year Active Life

|                     |        |       |          |        |                           |         |          |        |        |                |        | 1997         |      | 1998         |      |
|---------------------|--------|-------|----------|--------|---------------------------|---------|----------|--------|--------|----------------|--------|--------------|------|--------------|------|
| Two Parameters      | Area   | Depth | Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | Cw / Cl | Wst. Den | Infil  | X-well | X-well Y- Well | Z-Well | 9-year Avg.  |      | 9-year Avg.  | T    |
| at High End         | (m2)   | (m)   |          | (mg/L) | (mg/kg)                   | (L/kg)  | (g/cm3)  | (m/yr) | (m)    | ٤              | Œ      | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case           | 60705  | 2.6   | 476      | 6.7    | 116.38                    | 14.73   | 0.84     | 0.17   | 430    | 117.75         | 6.5    | 3.96E-02     |      | 4.26E-02     |      |
| Wst. Conc. & X-Well | 60705  | 2.6   | 476      | 6.7    | 200                       | 63.29   | 0.84     | 0.17   | 102    | 93.79          | 6.5    | 1.21E-01     | 15   | 5.73E-01     | -    |
| Wst. Vol & X-Well   | 60705  | 2.6   | 1842.9   | 6.7    | 116.38                    | 14.73   | 0.84     | 0.17   | 102    | 93.79          | 6.5    | 1.21E-01     | 16   | 5.24E-01     | 2    |
| Wst. Vol & Wst Conc | 60705  | 2.6   | 1842.9   | 6.7    | 200                       | 63.29   | 0.84     | 0.17   | 430    | 117.75         | 6.5    | 5.97E-02     | 82   | 4.62E-01     | 3    |
| Wst. Conc. & Y-Well | 60705  | 2.6   | 476      | 7.9    | 200                       | 63.29   | 0.84     | 0.17   | 430    | 0.00           | 6.5    | 2.39E-01     | 4    | 3.06E-01     | 4    |
| Wst. Vol & Y-Well   | 60705  | 2.6   | 1842.9   | 6.7    | 116.38                    | 14.73   | 0.84     | 0.17   | 430    | 0.00           | 6.5    | 2.37E-01     | 2    | 2.79E-01     | ည    |
| Wst. Conc & Infil   | 60705  | 2.6   | 476      | 7.9    | 200                       | 63.29   | 0.84     | 0.46   | 430    | 117.75         | 6.5    | 1.31E-01     | 13   | 2.02E-01     | 9    |
| Wst. Conc & TCLP    | 60705  | 2.6   | 476      | 39     | 200                       | 12.82   | 0.84     | 0.17   | 430    | 117.75         | 6.5    | 1.84E-01     | 7    | 1.84E-01     | 7    |
| Wst. Vol & Infil    | 60705  | 2.6   | 1842.9   | 7.9    | 116.38                    | 14.73   | 0.84     | 0.46   | 430    | 117.75         | 6.5    | 1.28E-01     | 14   | 1.83E-01     | 80   |
| Wst. Vol & TCLP     | 60705  | 2.6   | 1842.9   | 39     | 116.38                    | 2.98    | 0.84     | 0.17   | 430    | 117.75         | 6.5    | 1.76E-01     | 6    | 1.65E-01     | 60   |
| X-Well & Y- Well    | 60705  | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.17   | 102    | 0.00           | 6.5    | 2.79E-01     | က    | 1.58E-01     | 9    |
| X-Well & TCLP       | 60705  | 2.6   | 476      | 39     | 116.38                    | 2.98    | 0.84     | 0.17   | 102    | 93.79          | 6.5    | 1.83E-01     | æ    | 1.46E-01     | F    |
| X-Well & Infil      | 60705  | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.46   | 102    | 93.79          | 6.5    | 2.02E-01     | ဖ    | 1.39E-01     | 12   |
| X-Well & Z-Well     | 60705  | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.17   | 102    | 93.79          | 1.3    | 1.33E-01     | 12   | 1.36E-01     | 13   |
| Wst. Conc & Z-Well  | 90209  | 2.6   | 476      | 7.9    | 200                       | 63.29   | 0.84     | 0.17   | 430    | 117.75         | 1.3    | 2.30E-02     | 56   | 8.58E-02     | 4    |
| Wst. Vo & Z-Well    | 60705  | 2.6   | 1842.9   | 7.9    | 116.38                    | 14.73   | 0.84     | 0.17   | 430    | 117.75         | 1.3    | 2.28E-02     | 27   | 7.82E-02     | 9    |
| Y-Well & TCLP       | 60705  | 2.6   | 476      | 39     | 116.38                    | 2.98    | 0.84     | 0.17   | 430    | 0.00           | 6.5    | 3.38E-01     | -    | 7.63E-02     | 15   |
| Wst. Conc & Area    | 420888 | 2.6   | 476      | 6.7    | 200                       | 63.29   | 0.84     | 0.17   | 430    | 238.82         | 6.5    | 1.63E-01     | 9    | 7.32E-02     | 12   |
| Y-Well & Infil      | 60705  | 2.6   | 476      | 6.7    | 116.38                    | 14.73   | 0.84     | 0.46   | 430    | 0.00           | 6.5    | 3.00E-01     | 2    | 6.76E-02     | 18   |
| Wst. Vol & Area     | 420888 | 2.6   | 1842.9   | 7.9    | 116.38                    | 14.73   | 0.84     | 0.17   | 430    | 238.82         | 6.5    | 1.47E-01     | 11   | 6.60E-02     | 19   |
| TCLP & Infil        | 60705  | 2.6   | 476      | 39     | 116.38                    | 2.98    | 0.84     | 0.46   | 430    | 117.75         | 6.5    | 1.05E-01     | 17   | 4.77E-02     | 8    |
| Y-Well & Z-Well     | 60705  | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.17   | 430    | 00.0           | 1.3    | 7.96E-02     | 92   | 3.79E-02     | 21   |
| X-Well & Area       | 420888 | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.17   | 102    | 217.62         | 6.5    | 7.27E-02     | 6    | 3.04E-02     | 22   |
| Infil & Z-Well      | 60705  | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.46   | 430    | 117.75         | 1.3    | 3.00E-02     | 25   | 2.28E-02     | 23   |
| TCLP & Z-Well       | 60705  | 2.6   | 476      | 39     | 116.38                    | 2.98    | 0.84     | 0.17   | 430    | 117.75         | 1.3    | 3.24E-02     | 24   | 2.15E-02     | 24   |
| Y-Well & Area       | 420888 | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.17   | 430    | 0.00           | 6.5    | 4.17E-02     | 21   | 1.77E-02     | 25   |
| TCLP & Area         | 420888 | 2.6   | 476      | 39     | 116.38                    | 2.98    | 0.84     | 0.17   | 430    | 238.82         | 6.5    | 3.84E-02     | 22   | 1.70E-02     | 92   |
|                     | 420888 | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.46   | 430    | 238.82         | 6.5    | 3.30E-02     | 23   | 1.37E-02     | 27   |
| Area & Z-Well       | 420888 | 2.6   | 476      | 7.9    | 116.38                    | 14.73   | 0.84     | 0.17   | 430    | 238.82         | 1.3    | 1.64E-02     | 28   | 1.05E-02     | 28   |
|                     | •      |       |          |        | •                         |         |          |        |        |                |        |              |      |              |      |

Table A.12 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene (TCLP=TC Regulatory Level) – Muncipal Areas (20 Year Active Life)

|                      |        |              |          |        |          |               |                  |        |        |                                   |                | 1997         |      | 1998         |      |
|----------------------|--------|--------------|----------|--------|----------|---------------|------------------|--------|--------|-----------------------------------|----------------|--------------|------|--------------|------|
| Two Parameters       |        | Depth Wst. V | Wst. Vol | TCLP   | Wst Conc | ວ<br>/ ×<br>ວ | Cw / CI Wst. Den |        | X-well | Infil   X-well   Y- Well   Z-Well | Z-Well         | 9-year Avg.  |      | 9-year Avg.  |      |
| at High End          | (m2)   | <u>(E</u> )  | (m3)     | (mg/L) | (mg/kg)  | (L/kg)        | (g/cm3)          | (m/yr) | Œ      | Ξ                                 | Ξ              | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case            | 60705  | 2.6          | 476      | 9:0    | 116.38   | 232.76        | 0.84             | 0.17   | 430    | 117.75                            | 6.5            | 4.05E-03     |      | 2.85E-02     |      |
| Wst. Conc. & X-Well  | 60705  | 2.6          | 476      | 0.5    | 200      | 1000.00       | 0.84             | 0.17   | 102    | 93.79                             | 6.5            | 8.60E-03     | 16   | 1.52E-01     | 1    |
| Wst. Vol & X-Well    | 60705  | 5.6          | 1842.9   | 9.0    | 116.38   | 232.76        | 0.84             | 0.17   | 102    | 93.79                             | 6.5            | 8.61E-03     | 15   | 1.49E-01     | 2    |
| X-Well & Infil       | 60705  | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.46   | 102    | 93.79                             | 6.5            | 2.63E-02     | 80   | 1.15E-01     | 3    |
| X-Well & Y- Well     | 60705  | 2.6          | 944      | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 102    | 0.00                              | 6.5            | 2.73E-02     | 7    | 9.86E-02     | 4    |
| Wst. Conc & Infil    | 60705  | 2.6          | 476      | 0.5    | 200      | 1000.00       | 0.84             | 0.46   | 430    | 117.75                            | 6.5            | 1.05E-02     | 4    | 9.61E-02     | 5    |
| Wst. Vol & Infil     | 60705  | 2.6          | 1842.9   | 0.5    | 116.38   | 232.76        | 0.84             | 0.46   | 430    | 117.75                            | 6.5            | 1.07E-02     | 13   | 9.22E-02     | 9    |
| Wst. Conc. & Y- Well | 60705  | 2.6          | 476      | 0.5    | 200      | 1000.00       | 0.84             | 0.17   | 430    | 0.00                              | 6.5            | 1.72E-02     | 5    | 9.06E-02     | 7    |
| Wst. Vol & Y- Weil   | 60705  | 2.6          | 1842.9   | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 430    | 0.00                              | 6.5            | 1.72E-02     | 6    | 8.83E-02     | 8    |
| X-Well & Z-Well      | 60705  | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 102    | 93.79                             | 1.3            | 1.30E-02     | 12   | 8.37E-02     | 6    |
| Wst. Vol & Wst Conc  | 60705  | 2.6          | 1842.9   | 0.5    | 200      | 1000.00       | 0.84             | 0.17   | 430    | 117.75                            | 6.5            | 3.97E-03     | 19   | 6.16E-02     | 10   |
| Wst. Conc & Area     | 420888 | 2.6          | 476      | 0.5    | 200      | 1000.00       | 0.84             | 0.17   | 430    | 238.82                            | 6.5            | 8.87E-02     | -    | 6.02E-02     | 11   |
| Y-Well & Infil       | 60705  | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.46   | 430    | 0.00                              | 6.5            | 4.14E-02     | 4    | 5.78E-02     | 12   |
| Wst. Vol & Area      | 420888 | 2.6          | 1842.9   | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 430    | 238.82                            | 6.5            | 8.45E-02     | 2    | 5.56E-02     | 13   |
| X-Well & Area        | 420888 | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 102    | 217.62                            | 6.5            | 6.39E-02     | က    | 2.94E-02     | 14   |
| Y-Well & Z-Well      | 60705  | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 430    | 0.0                               | 1.3            | 8.05E-03     | 17   | 2.51E-02     | 15   |
| Wst. Conc & Z-Well   | 60705  | 2.6          | 476      | 5:0    | 200      | 1000.00       | 0.84             | 0.17   | 430    | 117.75                            | 1.3            | 1.65E-03     | 21   | 2.51E-02     | 16   |
| Wst. Vo & Z-Well     | 60705  | 2.6          | 1842.9   | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 430    | 117.75                            | 1.3            | 1.66E-03     | 20   | 2.45E-02     | 17   |
| Infil & Z-Well       | 60705  | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.46   | 430    | 117.75                            | 1.3            | 4.15E-03     | 8    | 1.95E-02     | 18   |
| Y-Well & Area        | 420888 | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 430    | 0.00                              | 6.5            | 3.74E-02     | 5    | 1.72E-02     | 19   |
| Infil & Area         | 420888 | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.46   | 430    | 238.82                            | 6.5            | 3.18E-02     | 9    | 1.34E-02     | 20   |
| Area & Z-Well        | 420888 | 2.6          | 476      | 0.5    | 116.38   | 232.76        | 0.84             | 0.17   | 430    | 238.82                            | <del>د</del> . | 1.46E-02     | F    | 1.01E-02     | 21   |
|                      |        |              |          |        |          |               |                  |        |        |                                   |                |              |      |              | ]    |

Table A.13 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Arsenic -- Industrial Areas -- 20 Year Active Life

|                      |        |       |         | 1     |                  |        |               |            |        |         |        | 4009       |      | 2007         |      |
|----------------------|--------|-------|---------|-------|------------------|--------|---------------|------------|--------|---------|--------|------------|------|--------------|------|
| Two Parameters       | Area   | Denth | Wet Vol | d iOL | Wet Conc Cw / Cl |        | Wet Den Infil | n fil      | X-well | Y. Well | 7.Well | 9-Vear Avg |      | 9-vear Ava   |      |
| at High End          | (m2)   | (E)   | (m3)    |       | (mg/kg)          |        | (g/cm3)       | (m/yr) (m) | (m)    | (E)     | (E)    | . I        | Rank | Conc. (mg/L) | Rank |
| Base Case            | 20200  | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 430    | 85.91   | 6.5    | 1.92E-03   |      | 1.23E-03     |      |
| Wst. Conc. & X-Well  | 20200  | 2.6   | 476     | 1.1   | 1600             | 1454.5 | 0.84          | 0.17       | 102    | 60.76   | 6.5    | 1.15E-02   | သ    | 2.24E-02     | -    |
| Wst. Vol & X-Well    | 20200  | 5.6   | 1842.9  | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 102    | 60.76   | 6.5    | 1.12E-02   | 9    | 2.14E-02     | 2    |
| Wst. Vol & Wst Conc  | 20200  | 2.6   | 1842.9  | 1.1   | 1600             | 1454.5 | 0.84          | 0.17       | 430    | 85.91   | 6.5    | 7.46E-03   | 13   | 1.58E-02     | က    |
| Wst. Conc. & Y- Well | 20200  | 2.6   | 476     | 1.1   | 1600             | 1454.5 | 0.84          | 0.17       | 430    | 0.00    | 6.5    | 2.11E-02   | -    | 1.41E-02     | 4    |
| Wst. Vol & Y- Well   | 20200  | 2.6   | 1842.9  | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 430    | 0.00    | 6.5    | 2.06E-02   | 2    | 1.35E-02     | 5    |
| X-Well & Infil       | 20200  | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.46       | 102    | 60.76   | 6.5    | 1.11E-02   | 7    | 1.09E-02     | 9    |
| X-Well & Y- Well     | 20200  | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 102    | 0.00    | 6.5    | 1.58E-02   | 3    | 8.12E-03     | 7    |
| X-Well & Z-Well      | 20200  | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 102    | 60.76   | 1.3    | 7.58E-03   | 12   | 7.04E-03     | 8    |
| Wst. Conc & Infil    | 20200  | 2.6   | 476     | 1.1   | 1600             | 1454.5 | 0.84          | 0.46       | 430    | 85.91   | 6.5    | 8.58E-03   | 6    | 6.22E-03     | 6    |
| Wst. Vol & Infil     | 20200  | 2.6   | 1842.9  | 1.1   | 393.3            | 357.5  | 0.84          | 0.46       | 430    | 85.91   | 6.5    | 8.31E-03   | 10   | 5.92E-03     | 9    |
| X-Well & TCLP        | 20200  | 2.6   | 476     | 4.9   | 393.3            | 80.3   | 0.84          | 0.17       | 102    | 60.76   | 6.5    | 5.90E-03   | 14   | 5.74E-03     | =    |
| Wst. Conc & TCLP     | 20200  | 2.6   | 476     | 4.9   | 1600             | 326.5  | 0.84          | 0.17       | 430    | 85.91   | 6.5    | 2.16E-03   | 19   | 4.99E-03     | 12   |
| Wst. Vol & TCLP      | 20200  | 2.6   | 1842.9  | 4.9   | 393.3            | 80.3   | 0.84          | 0.17       | 430    | 85.91   | 6.5    | 7.63E-03   | 11   | 4.75E-03     | 13   |
| Y-Well & Infil       | 20200  | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.46       | 430    | 0.00    | 6.5    | 1.17E-02   | 4    | 3.71E-03     | 14   |
|                      | 20200  | 2.6   | 476     | 4.9   | 393.3            | 80.3   | 0.84          | 0.17       | 430    | 0.00    | 6.5    | 9.66E-03   | 8    | 3.56E-03     | 15   |
| Wst. Conc & Area     | 162000 | 2.6   | 476     | 1.1   | 1600             | 1454.5 | 0.84          | 0.17       | 430    | 165.01  | 6.5    | 3.54E-03   | 16   | 2.82E-03     | 16   |
| Wst. Vol & Area      | 162000 | 2.6   | 1842.9  | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 430    | 165.01  | 6.5    | 3.37E-03   | 17   | 2.68E-03     | 17   |
| Wst. Conc & Z-Well   | 20200  | 2.6   | 476     | 1.1   | 1600             | 1454.5 | 0.84          | 0.17       | 430    | 85.91   | 1.3    | 2.02E-03   | 20   | 2.40E-03     | 48   |
| Wst. Vo & Z-Well     | 20200  | 2.6   | 1842.9  | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 430    | 85.91   | 1.3    | 1.98E-03   | 21   | 2.29E-03     | 19   |
| X-Well & Area        | 162000 | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 102    | 142.35  | 6.5    | 1.76E-03   | 22   | 1.80E-03     | 20   |
| Y-Well & Z-Well      | 20200  | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 430    | 0.00    | 1.3    | 4.00E-03   | 15   | 1.78E-03     | 21   |
| TCLP & Infil         | 20200  | 2.6   | 476     | 4.9   | 393.3            | 80.3   | 0.84          | 0.46       | 430    | 85.91   | 6.5    | 2.89E-03   | 18   | 1.54E-03     | 22   |
| Y-Well & Area        | 162000 | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 430    | 0.00    | 6.5    | 9.45E-04   | 24   | 8.40E-04     | 23   |
| Infil & Area         | 162000 | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.46       | 430    | 165.01  | 6.5    | 8.88E-04   | 26   | 7.71E-04     | 24   |
| Infil & Z-Well       | 20200  | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.46       | 430    | 85.91   | 1.3    | 1.16E-03   | 23   | 7.15E-04     | 25   |
| TCLP & Area          | 162000 | 2.6   | 476     | 4.9   | 393.3            | 80.3   | 0.84          | 0.17       | 430    | 165.01  | 6.5    | 8.71E-04   | 27   | 6.93E-04     | 26   |
| TCLP & Z-Well        | 20200  | 2.6   | 476     | 4.9   | 393.3            | 80.3   | 0.84          | 0.17       | 430    | 85.91   | 1.3    | 9.25E-04   | 25   | 6.04E-04     | 27   |
| Area & Z-Well        | 162000 | 2.6   | 476     | 1.1   | 393.3            | 357.5  | 0.84          | 0.17       | 430    | 165.01  | 1.3    | 3.80E-04   | 28   | 3.72E-04     | 28   |
|                      |        |       |         | 1.0   |                  |        |               |            |        |         |        |            |      |              |      |

Table A.14 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Arsenic - Muncipal Areas -- 20 Year Active Life

|                      |        |       |          |     |                  |        |                | T     |        |         |        | 1997  |      | 1998        |      |
|----------------------|--------|-------|----------|-----|------------------|--------|----------------|-------|--------|---------|--------|---|------|-------------|------|
| Two Parameters       | Area   | Depth | Wst. Vol |     | Wst Conc Cw / Cl |        | Wst. Den Infil | Infil | X-well | Y- Well | Z-Well | X-well Y- Well 2-Well 9-year Avg. 9-year Avg. | Dank | 9-year Avg. | Dank |
| Base Case            | 60705  | 26    | 476      | 1.1 | 393.3            | 357.5  | 0.84           | 0.17  | 8      | 117.75  | 6.5    | 1.92E-03                                      | 2    | 1.09E-03    | 9    |
| Wst. Vol & Wst Conc  | 60705  | 2.6   | 1842.9   | -   | 1600             | 1454.6 | 0.84           | 0.17  | 430    | 117.75  | 6.5    | 7.46E-03                                      | 13   | 1.66E-02    | -    |
| Wst. Conc. & X-Well  | 60705  | 2.6   | 476      | 1.  | 1600             | 1454.5 | 28.0           | 0.17  | 102    | 93.79   | 6.5    | 1.15E-02                                      | 5    | 1.55E-02    | 2    |
| Wst. Vol & X-Well    | 60705  | 2.6   | 1842.9   | 1.1 | 393.3            | 357.5  | 28.0           | 0.17  | 102    | 93.79   | 6.5    | 1.12E-02                                      | 9    | 1.47E-02    | 3    |
| Wst. Conc. & Y- Well | 60705  | 2.6   | 476      | 1.1 | 1600             | 1454.5 | 0.84           | 0.17  | 430    | 0.00    | 6.5    | 2.11E-02                                      | -    | 7.15E-03    | 4    |
| Wst. Vol & Y-Well    | 60705  | 2.6   | 1842.9   | 1.1 | 393.3            | 357.5  | 0.84           | 0.17  | 430    | 0.00    | 6.5    | 2.06E-02                                      | 2    | 6.80E-03    | 5    |
| X-Well & Infil       | 60705  | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 0.84           | 0.46  | 102    | 93.79   | 6.5    | 1.11E-02                                      | 7    | 5.09E-03    | 9    |
| Wst. Conc & Infil    | 60705  | 2.6   | 476      | 1.1 | 1600             | 1454.5 | 0.84           | 0.46  | 430    | 117.75  | 6.5    | 8.58E-03                                      | 6    | 5.02E-03    | 7    |
| Wst. Vol & Infil     | 60705  | 2.6   | 1842.9   | 1:1 | 393.3            | 357.5  | 28.0           | 0.46  | 430    | 117.75  | 6.5    | 8.31E-03                                      | 5    | 4.78E-03    | 80   |
| Wst. Conc & TCLP     | 60705  | 2.6   | 476      | 4.9 | 1600             | 326.5  | 28.0           | 0.17  | 430    | 117.75  | 6.5    | 2.16E-03                                      | 19   | 4.44E-03    | ര    |
| Wst. Vol & TCLP      | 60705  | 2.6   | 1842.9   | 4.9 | 393.3            | 80.3   | 28.0           | 0.17  | 430    | 117.75  | 6.5    | 7.63E-03                                      | 11   | 4.22E-03    | 9    |
| X-Well & Y- Well     | 60705  | 2.6   | 476      | 1:  | 393.3            | 357.5  | 28.0           | 0.17  | 102    | 0.00    | 6.5    | 1.58E-02                                      | က    | 4.10E-03    | 11   |
| X-Well & TCLP        | 60705  | 2.6   | 476      | 4.9 | 393.3            | 80.3   | 0.84           | 0.17  | 102    | 93.79   | 6.5    | 5.90E-03                                      | 14   | 3.82E-03    | 12   |
| X-Well & Z-Well      | 60705  | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 28.0           | 0.17  | 102    | 93.79   | 1.3    | 7.58E-03                                      | 12   | 3.65E-03    | 13   |
| Wst. Conc & Z-Well   | 60705  | 2.6   | 476      | 1.1 | 1600             | 1454.5 | 28.0           | 0.17  | 430    | 117.75  | 1.3    | 2.02E-03                                      | 8    | 2.25E-03    | 14   |
| Wst. Vo & Z-Well     | 60705  | 2.6   | 1842.9   | 1.1 | 393.3            | 357.5  | 0.84           | 0.17  | 430    | 117.75  | 1.3    | 1.98E-03                                      | 21   | 2.14E-03    | 15   |
| Y-Well & TCLP        | 60705  | 2.6   | 476      | 4.9 | 393.3            | 80.3   | 28.0           | 0.17  | 430    | 0.00    | 6.5    | 9.66E-03                                      | 8    | 1.76E-03    | 16   |
| Y-Well & Infil       | 60705  | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 0.84           | 0.46  | 430    | 0.00    | 6.5    | 1.17E-02                                      | 4    | 1.69E-03    | 17   |
| Wst. Conc & Area     | 420888 | 2.6   | 476      | 1.1 | 1600             | 1454.5 | 28.0           | 0.17  | 430    | 238.82  | 6.5    | 3.54E-03                                      | 16   | 1.53E-03    | 8    |
| Wst. Vol & Area      | 420888 | 2.6   | 1842.9   | 1.1 | 393.3            | 357.5  | 0.84           | 0.17  | 430    | 238.82  | 6.5    | 3.37E-03                                      | 17   | 1.45E-03    | 19   |
| TCLP & Infil         | 60705  | 2.6   | 476      | 4.9 | 393.3            | 80.3   | 0.84           | 0.46  | 430    | 117.75  | 6.5    | 2.89E-03                                      | 18   | 1.24E-03    | 20   |
| Y-Well & Z-Well      | 60705  | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 0.84           | 0.17  | 430    | 00.0    | 1.3    | 4.00E-03                                      | 15   | 8.88E-04    | 21   |
| XWell & Area         | 420888 | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 0.<br>28.      | 0.17  | 102    | 217.62  | 6.5    | 1.76E-03                                      | 22   | 6.87E-04    | 22   |
| Infil & Z-Well       | 60705  | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 9.<br>28.      | 0.46  | 430    | 117.75  | 1.3    | 1.16E-03                                      | 23   | 6.12E-04    | 23   |
| TCLP & Z-Well        | 60705  | 2.6   | 476      | 4.9 | 393.3            | 80.3   | 0.84           | 0.17  | 430    | 117.75  | 1.3    | 9.25E-04                                      | 22   | 5.54E-04    | 24   |
| Y-Well & Area        | 420888 | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 0.84           | 0.17  | 430    | 00.0    | 6.5    | 9.45E-04                                      | 24   | 3.84E-04    | 25   |
| TCLP & Area          | 420888 | 2.6   | 476      | 4.9 | 393.3            | 80.3   | 0.84           | 0.17  | 430    | 238.82  | 6.5    | 8.71E-04                                      | 22   | 3.75E-04    | 56   |
| Infil & Area         | 420888 | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 0.84           | 0.46  | 430    | 238.82  | 6.5    | 8.88E-04                                      | 56   | 3.49E-04    | 27   |
| Area & Z-Well        | 420888 | 2.6   | 476      | 1.1 | 393.3            | 357.5  | 0.84           | 0.17  | 430    | 238.82  | 1.3    | 3.80E-04                                      | 28   | 2.33E-04    | 28   |
|                      |        |       |          |     |                  |        |                |       |        |         |        |   |      |             |      |

Table A.15 Off-Spec Products and Fines Off-site Landfill/Benz(a)anthracene --Industrial Areas -- 20 Year Active Life

| Turn Domeston       |              |              |                        |           |          |         |          |        |     |                |     | 1997              |      | 1998         |      |
|---------------------|--------------|--------------|------------------------|-----------|----------|---------|----------|--------|-----|----------------|-----|-------------------|------|--------------|------|
| at High End         | Area<br>(m2) | meber<br>(m) | Depth Wst. Vol.        | 475       | Wst Conc | Cw / Cl | Wst. Den | lu (i  |     | X-well Y- Well | N   | 9-year Avg.       |      | 9-year Avg.  |      |
| Baco Coop           | (ann)        |              | (00000                 | (11) g/L/ | 티        | (L/Kg)  | (g/cm3)  | (m/yr) |     | Œ              | Ē   | Conc. (mg/L) Rank | Rank | Conc. (mg/L) | Rank |
| המשם המשפ           | 20200        | CI .7        | 1439.08                | 0.013     |          | 923.08  | 1.26     | 0.17   | 430 | 85.91          | 6.5 | 4.16E-06          |      | 1.02E-05     |      |
| Wst. Vol & X-Well   | 20200        | 2.15         | 10460.3                | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 102 | 92.09          | 6.5 | 1.04E-04          | 7    | 6.39E-04     | 1    |
| X-Well & Infil      | 20200        | 2.15         | 1439.68                | 0.013     | 12       | 923.08  | 1.26     | 0.46   | 102 | 60.76          | 6.5 | 3.19E-04          | 2    | 4.49E-04     | 2    |
| Wst. Vol & Infil    | 20200        | 2.15         | 10460.3                | 0.013     | 12       | 923.08  | 1.26     | 0.46   | 430 | 85.91          | 6.5 | 2.00E-04          | 4    | 4.02E-04     | 3    |
| Wst. Conc. & X-Well | 20200        | 2.15         | 1439.68                | 0.013     | 28       | 2153.85 | 1.26     | 0.17   | 102 | 92.09          | 6.5 | 9.68E-05          | 80   | 3.92E-04     | 4    |
| X-Well & Y-Well     | 20200        | 2.15         | 1439.68                | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 102 | 0.00           | 6.5 | 2.85E-04          | ٣    | 2.96E-04     | 5    |
| X-Well & Z-Well     | 20200        | 2.15         | 1439.68                | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 102 | 60.76          | 1.3 | 1.60E-04          | 2    | 2.87E-04     | 9    |
| Y-Well & Infil      | 20200        | 2.15         | 1439.68                | 0.013     | 12       | 923.08  | 1.26     | 0.46   | 430 | 0.00           | 6.5 | 3.85E-04          | -    | 1.54E-04     | 7    |
| Wst. Conc & Infil   | 20200        | 2.15         | 1439.68                | 0.013     | 28       | 2153.85 | 1.26     | 0.46   | 430 | 85.91          | 6.5 | 1.49E-04          | 9    | 1.47E-04     | 80   |
| Wst. Vol & Y- Well  | 20200        | 2.15         | 2.15 10460.3           | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 430 | 0.00           | 6.5 | 3.17E-05          | 13   | 7.30E-05     | 6    |
| X-Well & Area       | 162000       | 2.15         | 1439.68                | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 102 | 142.35         | 6.5 | 6.13E-05          | 6    | 6.24E-05     | 9    |
| Wst. Conc. & Y-Well | 20200        | 2.15         | 1439.68                | 0.013     | 28       | 2153.85 | 1.26     | 0.17   | 430 | 0.00           | 6.5 | 3.03E-05          | 14   | 5.20E-05     | F    |
| Wst. Vol & Area     | 162000       | 2.15         | 10460.3                | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 430 | 165.01         | 6.5 | 5.13E-05          | 5    | 4.43E-05     | 12   |
| Infil & Area        | 162000       | 2.15         | 1439.68                | 0.013     | 12       | 923.08  | 1.26     | 0.46   | 430 | 165.01         | 6.5 | 3.71E-05          | 12   | 3.23E-05     | 13   |
| Infil & Z-Well      | 20200        | 2.15         | 1439.68                | 0.013     | - 12     | 923.08  | 1.26     | 0.46   | 430 | 85.91          | 1.3 | 3.84E-05          | E    | 2.98E-05     | 14   |
| Wst. Vol & Wst Conc | 20200        | 2.15         | 2.15   10460.3   0.013 | 0.013     | 28       | 2153.85 | 1.26     | 0.17   | 430 | 85.91          | 6.5 | 4.73E-06          | 19   | 2.52E-05     | 15   |
| Y-Well & Z-Well     | 20200        | 2.15         | 1439.68                | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 430 | 0.00           | 1.3 | 1.94E-05          | 16   | 2.32E-05     | 16   |
| Wst. Conc & Area    | 162000       | 2.15         | 1439.68                | 0.013     | 28       | 2153.85 | 1.26     | 0.17   | 430 | 165.01         | 6.5 | 2.06E-05          | 15   | 1.75E-05     | 17   |
| Wst. Vo & Z-Well    | 20200        | 2.15         | 10460.3                | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 430 | 85.91          | 1.3 | 3.07E-06          | 8    | 1.68E-05     | 18   |
| Wst. Conc & Z-Well  | 20200        | 2.15         |                        | 0.013     | 28       | 2153.85 | 1.26     | 0.17   | 430 | 85.91          | 1.3 | 2.93E-06          | 21   | 1.18E-05     | 19   |
| Y-Well & Area       | 162000       | 2.15         |                        | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 430 | 0.00           | 6.5 | 9.87E-06          | 11   | 9.19E-06     | 20   |
| Area & ∠-Well       | 162000       | 2.15         | 1439.68                | 0.013     | 12       | 923.08  | 1.26     | 0.17   | 430 | 165.01         | 1.3 | 6.16E-06          | 18   | 6.05E-06     | 21   |
|                     |              |              |                        |           |          |         |          |        |     |                | _   |                   |      |              | _    |

Table A.16 Off-Spec Products and Fines Off-site Landfill/Benz(a)anthracene -- Municipal Areas -- 20 Year Active Life

|                      |        |        |                   |             |         |                                      |          |          |        |                       |        | 200             |                   |        |
|----------------------|--------|--------|-------------------|-------------|---------|--------------------------------------|----------|----------|--------|-----------------------|--------|-----------------|-------------------|--------|
| T. chamber           |        |        | 10/-4 1/-1        | Ç           | (       |                                      | ;        |          | ;      |                       | ;      | /ARL            | 1998              | -      |
| I WO Parameters      |        | S deba | Deput war voi ICI | ב<br>ב      | _       | ```````````````````````````````````` | WSt. Den | <u>=</u> | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.     | 9-year Avg.       |        |
| at High End          | (m2)   | Œ      | (m3)              | (m3) (mg/L) | (mg/kg) | (L/kg)                               | (g/cm3)  | (m/yr)   | Ξ      | Œ                     | Ξ      | Conc. (mg/L) Ra | Rank Conc. (mg/L) | ) Rank |
| Base Case            | 60705  | 2.15   | 1439.68 0.0       | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 430    | 117.75                | 6.5    | 4.16E-06        | 1.01E-05          |        |
| Wst. Vol & X-Well    | 60705  | 2.15   | 10460.3           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 102    | 93.79                 | 6.5    | 1.04E-04        | 7 6.96E-04        | -      |
| Wst. Vol & Infil     | 60705  | 2.15   | 10460.3           | 0.013       | 12      | 923.08                               | 1.26     | 0.46     | 430    | 117.75                | 6.5    | 2.00E-04        | 4 3.47E-04        | 2      |
| Wst. Conc. & X-Well  | 60705  | 2.15   | 1439.68           | 0.013       | 28      | 2153.85                              | 1.26     | 0.17     | 102    | 93.79                 | 6.5    | 9.68E-05        | 8 3.02E-04        | 3      |
| X-Well & Infil       | 60705  | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.46     | 102    | 93.79                 | 6.5    | 3.19E-04 2      | 2.11E-04          | 4      |
| X-Well & Z-Well      | 60705  | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 102    | 93.79                 | 1.3    | 1.60E-04 5      | 1.51E-04          | 2      |
| X-Well & Y- Well     | 60705  | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 102    | 0.00                  | 6.5    | 2.85E-04 3      | 1.49E-04          | 9      |
| Wst. Conc & Infil    | 60705  | 2.15   | 1439.68           | 0.013       | 28      | 2153.85                              | 1.26     | 0.46     | 430    | 117.75                | 6.5    | 1.49E-04 6      | 1.14E-04          | 7      |
| Y-Well & Infil       | 60705  | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.46     | 430    | 0.00                  | 6.5    | 3.85E-04 1      | 7.04E-05          | 80     |
| Wst. Vol & Y- Well   | 60705  | 2.15   | 10460.3           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 430    | 0.00                  | 6.5    | 3.17E-05 13     | 3 6.63E-05        | 6      |
| Wst. Vol & Wst Conc  | 60705  | 2.15   | 10460.3           | 0.013       | 28      | 2153.85                              | 1.26     | 0.17     | 430    | 117.75                | 6.5    | 4.73E-06 19     | 5.10E-05          | 9      |
| Wst. Vol & Area      | 420888 | 2.15   | 10460.3           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 430    | 238.82                | 6.5    | 5.13E-05 10     | 3.65E-05          | 7      |
| Wst. Conc. & Y- Well | 60705  | 2.15   | 1439.68           | 0.013       | 28      | 2153.85                              | 1.26     | 0.17     | 430    | 000                   | 6.5    | 3.03E-05 14     | 3.43E-05          | 12     |
| Wst. Vo & Z-Well     | 60705  | 2.15   | 10460.3           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 430    | 117.75                | 1.3    | 3.07E-06 20     | 2.94E-05          | 13     |
| infil & Z-Well       | 60705  | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.46     | 430    | 117.75                | 1.3    | 3.84E-05 11     | 2.42E-05          | 4      |
| X-Well & Area        | 420888 | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 102    | 217.62                | 6.5    | 6.13E-05 9      | 2.38E-05          | 15     |
| Wst. Conc & Z-Well   | 60705  | 2.15   | 1439.68           | 0.013       | 28      | 2153.85                              | 1.26     | 0.17     | 430    | 117.75                | 1.3    | 2.93E-06 21     | 1.47E-05          | 16     |
| Infil & Area         | 420888 | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.46     | 430    | 238.82                | 6.5    | 3.71E-05 12     | 1.45E-05          | 17     |
| Wst. Conc & Area     | 420888 | 2.15   | 1439.68           | 0.013       | 28      | 2153.85                              | 1.26     | 0.17     | 430    | 238.82                | 6.5    | 2.06E-05 15     | 1.26E-05          | 18     |
| Y-Well & Z-Well      | 60705  | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 8      | 0.00                  | 1.3    | 1.94E-05 16     | 1.24E-05          | 19     |
| Y-Well & Area        | 420888 | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 430    | 0.00                  | 6.5    | 9.87E-06 17     | 5.61E-06          | 8      |
| Area & Z-Well        | 420888 | 2.15   | 1439.68           | 0.013       | 12      | 923.08                               | 1.26     | 0.17     | 430    | 238.82                | 1.3    | 6.16E-06 18     | 4.52E-06          | 21     |
|                      |        |        |                   |             |         |                                      |          |          |        |                       |        |                 |                   |        |

Table A17 Sensitivity Analysis with TCLP set to High-End Value, Off-Spec Product and Fines Off-site Landfill/Benz(a)anthracene -- Industrial Areas (20-Year Waste Active Life)

| Two Parameters            | Area   | Depth | Area Depth Wst. Vol | TCIP   | TCLP Wet Conc | 2       | Wet Don                | 4      |        |         |              | 1997            |        | 1998        |      |
|---------------------------|--------|-------|---------------------|--------|---------------|---------|------------------------|--------|--------|---------|--------------|-----------------|--------|-------------|------|
| at High End               | (m2)   | (m)   | (m3)                | (mg/L) | (mg/kg)       | (Lkg)   | (g/cm3) (m/yr) (m) (m) | (m/r)  | Y-well | 7- Well | Z-Well       | 9-year Avg.     | 7      | 9-year Avg. |      |
| Base Case                 | 20200  | 2.15  | 1439.68             | 0.013  | 12            | 923.08  | 1.26                   | 0 17   | 430    | 85 01   | (m)          | COILC. (IIIg/L) | Yall K | A 46E OC    | Kank |
| X-well                    | 20200  | 2 15  | 1430 68             | 0 040  | ,             | 0000    |                        |        |        | 3       | 5.0          | 4. IOE-UO       |        | 1.02E-05    |      |
| 1 614                     |        | 2     | 123.00              | 20.0   | 7,            | 923.08  | 1.26                   | 0.17   | 102    | 92.09   | 6.5          | 8.46E-05        | 7      | 2 11F-04    | -    |
| Inhitration               | 20200  | 2.15  | 1439.68             | 0.013  | 12            | 923.08  | 1.26                   | 0.46   | 430    | 85.91   | 6.5          | 0 205 05        |        | 100         | -    |
| Y-well                    | 20200  | 2.15  | 1439 68             | 0 013  | 45            | 002500  | 90 7                   | ;      |        |         | 3            | 9.292-03        | -      | 0.41E-05    | 7    |
| 14/242 1/21               |        |       | 2                   | 3      | 7.            | 523,00  | 9                      | -<br>- | 930    | 8       | 6.5          | 2.80E-05        | 3      | 3 25F-05    | ~    |
| wste volume               | 20200  | 2.15  | 10460.3             | 0.013  | 12            | 923.08  | 1.26                   | 0.17   | 430    | 85.01   | A.A.         | 90 203 /        | 1      | 20100       | ,    |
| Waste Concentration 20200 |        | 2.15  | 1439.68             | 0 013  | 28            | 2452 95 | 4 26                   | ;      |        |         | 3            | 4.00E-U0        | n      | Z.Z/E-05    | 4    |
| Aroa                      |        |       |                     |        | 3             | 4100.00 | 1.20                   | 0.17   | 930    | 85.91   | 6.5          | 4.48E-06        | ~      | 1.62E-05    | 5    |
| Aiga                      | 162000 | 2.15  | 1439.68             | 0.013  | 12            | 923.08  | 1.26                   | 0.17   | 430    | 165 01  | 6.5          | 0 285 08        | ŀ      | 7 05 1 00   | 1    |
| Z-well                    | 20200  | 2.15  | 1439 68             | 0 043  | 12            | 003 00  | †                      | 1      |        |         | 3            | 9.305-70        | 7      | 1.30E-06    | ٥    |
|                           |        |       | 7,51                | 212    | 7             | 323.00  | 9.                     | O.1    | 5      | 85.91   | <del>ر</del> | 2.70E-06        | 9      | 7 21E-06    | 7    |

Table A.18 Sensitivity Analysis with TCLP set to High-End Value, Off-Spec Products and Fines Off-site Landfill/Benz(a)anthracene -- Municipal Are (20 Year Waste Active Life)

| Two Daramotore      | V 202  | 44.20  |         | ,<br>,    | 0                                      |                    |   |        |       |                |               | 1997                        | Γ    | 1998                                      |      |
|---------------------|--------|--------|---------|-----------|--|--------------------|---|--------|-------|----------------|---------------|-----------------------------|------|---|------|
| at High End         | (m2)   | (m) (m |         | (mg/L)    | Vol ICLP WSt Conc<br>3) (mg/L) (mg/kg) | Cw<br>(E/kg)<br>CV | (g/cm <sup>3</sup> ) (m/yr) (m) (m) (m) | (m/yr) | Hew-X | Y- Well<br>(m) | Z-Well<br>(m) | 9-year Avg.<br>Conc, (mg/L) | Rank | 9-year Avg. 9-year Avg. Conc. (mg/L) Rank | Rank |
| Base Case           | 60705  | 2.15   | 1439.68 | .68 0.013 | 12                                     | 923.08             | 1.26                                    | 0.17   | 83    | 117.75         | 6.5           | 4.16E-06                    |      | 1 01E-05                                  |      |
| X-well              | 60705  | 2.15   | 1439.68 | 0.013     | 12                                     | 923.08             | 1.26                                    | 0.17   | 102   | 93.79          | 6.5           | 8 46E-05                    | 'n   | 1 39F-04                                  | , -  |
| Infiltration        | 60705  | 2.15   | 1439.68 | .68 0.013 | 12                                     | 923.08             | 1.26                                    | 0.46   | 430   | 117.75         | 6.5           | 9 29E-05                    | -    | 4 89F-05                                  | -    |
| Wste Volume         | 60705  | 2.15   | 10460.3 | 0.3 0.013 | 12                                     | 923.08             | 1.26                                    | 0.17   | 430   | 117.75         | 6.5           | 4 68F-06                    | . 4  | 3 88E OF                                  | 1 6  |
| Waste Concentration | 60705  | 2.15   | 1439    | .68 0.013 | 28                                     | 2153.85            | 1.26                                    | 0.17   | 430   | 117.75         | 8.5           | 4 48E-06                    | , «  | 3.00E-03                                  | 7    |
| Y-well              | 60705  | 2.15   | 1439.68 | .68 0.013 | 12                                     | 923.08             | 1.26                                    | 0.17   | 430   | 0.00           | 6.5           | 2 80F-05                    |      | 1 73E 06                                  | + 4  |
| Z-well              | 60705  | 2.15   | 1439.68 | 0.013     | 12                                     | 923.08             | 1.26                                    | 0.17   | 83    | 117.75         | 13            | 2 70F-06                    | , ,  | 7.24E.06                                  | , ,  |
| Area                | 420888 | 2.15   | 1439.68 | 68 0.013  | 12                                     | 923.08             | 1.26                                    | 0.17   |       | 238.82         | 6.5           | 9.38E-06                    | 4    | 5.52E-06                                  | - 00 |

Table A.19 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene -- Industrial Areas - 20 year Active Life

|                      |        |              |          |                |          | ·      |                  |                 |        |                |        | 1007        |              | 0007        |      |
|----------------------|--------|--------------|----------|----------------|----------|--------|------------------|-----------------|--------|----------------|--------|-------------|--------------|-------------|------|
|                      |        |              |          | i i            |          |        |                  |                 | ;      |                |        | 1661        |              | 0661        |      |
| iwo Parameters       | Area   | Depth<br>(m) | WSt. Vol | TCLP<br>(mg/l) | Wst Conc | (      | Cw / Cl Wst. Den | Infil<br>(m/kr) | X-well | X-well Y- Well | Z-Well | 9-year Avg. | Dank<br>Aned | 9-year Avg. | Rank |
| Base Case            | 20200  | ┸            | 1476     | 1.49           | 1        | 29.35  |                  | 0.17            | 430    | 85.91          | 6.5    | 3.93E-03    |              | 4.35E-02    | _    |
| Infil & Xwell        | 20200  | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.46            | 102    | 60.76          | 6.5    | 7.33E-02    | 7            | 3.19E-01    | -    |
| TCLP & xwell         | 20200  | 2.6          | 1476     | 4.2            | 43.73    | 10.41  | 1.2              | 0.17            | 102    | 60.76          | 6.5    | 6.40E-02    | 9            | 2.64E-01    | 2    |
| Xwell & Wst Vol      | 20200  | 2.6          | 8333.3   | 1.49           | 43.73    | 29.349 | 1.2              | 0.17            | 102    | 60.76          | 6.5    | 2.49E-02    | 22           | 2.35E-01    | က    |
| Ywell & Xwell        | 20200  | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.17            | 102    | 0.00           | 6.5    | 7.69E-02    | 9            | 2.28E-01    | 4    |
| Xwell & Wst. Conc    | 20200  | 2.6          | 1476     | 1.49           | 100      | 67.11  | 1.2              | 0.17            | 102    | 60.76          | 6.5    | 2.53E-02    | 21           | 2.04E-01    | 5    |
| Ywell & TCLP         | 20200  | 2.6          | 1476     | 4.2            | 43.73    | 10.41  | 1.2              | 0.17            | 430    | 0.00           | 6.5    | 1.23E-01    | က            | 1.96E-01    | 9    |
| Ywell & Wst. Vol     | 20200  | 2.6          | 8333.3   | 1.49           | 43.73    | 29.349 | 1.2              | 0.17            | 430    | 0.00           | 6.5    | 4.98E-02    | 14           | 1.92E-01    | 7    |
| Xwell & Zwell        | 20200  | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.17            | 102    | 60.76          | 1.3    | 3.65E-02    | 15           | 1.91E-01    | 8    |
| Area & Wst. Vol      | 162000 | 2.6          | 8333.3   | 1.49           | 43.73    | 29.349 | 1.2              | 0.17            | 430    | 165.01         | 6.5    | 2.26E-01    | -            | 1.88E-01    | 6    |
| Ywell & Infil        | 20200  | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.46            | 430    | 0.00           | 6.5    | 1.15E-01    | 4            | 1.75E-01    | 9    |
| Ywell & Wst Conc     | 20200  | 5.6          | 1476     | 1.49           | 8        | 67.11  | 1.2              | 0.17            | 430    | 0.00           | 6.5    | 5.09E-02    | 13           | 1.64E-01    | 11   |
| TCLP & Wst. Vol      | 20200  | 2.6          | 8333.3   | 4.2            | 43.73    | 10.412 | 1.2              | 0.17            | 430    | 85.91          | 6.5    | 3.20E-02    | 16           | 1.55E-01    | 12   |
| Infil & Wst. Vol     | 20200  | 2.6          | 8333.3   | 1.49           | 43.73    | 29.349 | 1.2              | 0.46            | 430    | 85.91          | 6.5    | 3.11E-02    | 92           | 1.53E-01    | 13   |
| Area & Xwell         | 162000 | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.17            | 102    | 142.35         | 6.5    | 1.15E-01    | 2            | 1.18E-01    | 14   |
| Infil & Wst. Conc    | 20200  | 5.6          | 1476     | 1.49           | 9        | 67.11  | 1.2              | 0.46            | 430    | 85.91          | 6.5    | 3.08E-02    | 19           | 1.15E-01    | 15   |
| TCLP & Wst Conc      | 20200  | 2.6          | 1476     | 4.2            | 100      | 23.81  | 1.2              | 0.17            | 430    | 85.91          | 6.5    | 3.12E-02    | 17           | 1.11E-01    | 16   |
| Area & Wst. Conc     | 162000 | 2.6          | 1476     | 1.49           | 100      | 67.11  | 1.2              | 0.17            | 430    | 165.01         | 6.5    | 1.25E-01    | 2            | 1.02E-01    | 17   |
| Infil & TCLP         | 20200  | 5.6          | 1476     | 4.2            | 43.73    | 10.41  | 1.2              | 0.46            | 430    | 85.91          | 6.5    | 6.45E-02    | 6            | 9.56E-02    | 18   |
| Wst. Vol & Wst. Conc | 20200  | 2.6          | 8333.3   | 1.49           | 100      | 67.11  | 1.2              | 0.17            | 430    | 85.91          | 6.5    | 1.15E-02    | 56           | 7.38E-02    | 19   |
| Ywell & Zwell        | 20200  | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.17            | 430    | 0.00           | 1.3    | 2.25E-02    | 23           | 6.13E-02    | 20   |
| Area & Ywell         | 162000 | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.17            | 430    | 0.00           | 6.5    | 6.66E-02    | 8            | 6.07E-02    | 21   |
| Area & TCLP          | 162000 | 2.6          | 1476     | 4.2            | 43.73    | 10.41  | 1.2              | 0.17            | 430    | 165.01         | 6.5    | 6.35E-02    | 11           | 5.15E-02    | 22   |
| Area & Infil         | 162000 | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.46            | 430    | 165.01         | 6.5    | 5.46E-02    | 12           | 5.02E-02    | 23   |
| Infil & Zwell        | 20200  | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.46            | 430    | 85.91          | 1.3    | 1,15E-02    | 22           | 3.37E-02    | 24   |
| TCLP & Zwell         | 20200  | 2.6          | 1476     | 4.2            | 43.73    | 10.41  | 1.2              | 0.17            | 430    | 85.91          | 1.3    | 1.18E-02    | 24           | 3.30E-02    | 25   |
| Wst. Vol & Zwell     | 20200  | 2.6          | 8333.3   | 1.49           | 43.73    | 29.35  | 1.2              | 0.17            | 430    | 85.91          | 1.3    | 4.79E-03    | 28           | 3.22E-02    | 26   |
| Wst Conc & Zwell     | 20200  | 2.6          | 1476     | 1.49           | 100      | 67.11  | 1.2              | 0.17            | 430    | 85.91          | 1.3    | 4.86E-03    | 27           | 2.75E-02    | 27   |
| Area & Zweli         | 162000 | 2.6          | 1476     | 1.49           | 43.73    | 29.35  | 1.2              | 0.17            | 430    | 165.01         | 1.3    | 2.61E-02    | 20           | 2.64E-02    | 28   |
|                      |        |              |          |                |          |        |                  |                 |        |                |        |             |              |             |      |

able A.20 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/Benzene (TCLP = TC Regulatory Level) -- Industrial Area (20 year Active Life)

|      | Γ                         | ¥            | Τ         | Τ             | Τ             | Τ             |                 | Τ            | Τ               |               | Т                 | Γ                | T                | Τ                | Τ                | Τ        | Γ        | ĺ        | Π             | T.                         | Т        | Τ             | Т                | Т                |
|------|---------------------------|--------------|-----------|---------------|---------------|---------------|-----------------|--------------|-----------------|---------------|-------------------|------------------|------------------|------------------|------------------|----------|----------|----------|---------------|----------------------------|----------|---------------|------------------|------------------|
| œ    |                           | Rank         | L         |               | 2             | ၉             | 4               | 5            | 9               | 7             | 8                 | 6                | 5                | =                | 12               | 13       | 14       | 15       | 16            | 17                         | 18       | 19            | 20               | 21               |
| 1998 | 9-year Avg.               | _            | 2.06E-02  | 1.71E-01      | 1.03E-01      | 1.01E-01      | 9.96E-02        | 9.55E-02     | 8.72E-02        | 8.64E-02      | 8.14E-02          | 7.24E-02         | 6.97E-02         | 6.65E-02         | 6.18E-02         | 5.39E-02 | 5.12E-02 | 4.69E-02 | 2.88E-02      | 2.48E-02                   | 2.21E-02 | 1.92E-02      | 1.21E-02         | 1 11E-02         |
|      |                           | Rank         |           | 41            | 5             | 12            | 6               | -            | 20              | 16            | 15                | 11               | 5                | 9                | 13               | 6        | 2        | 17       | 7             | 21                         | 4        | 8             | 18               | ę                |
| 1997 | 9-year Avg.               | Conc. (mg/L) | 3.93E-03  | 1.07E-02      | 1.73E-02      | 1.28E-02      | 8.37E-02        | 1.19E-01     | 1.66E-03        | 8.61E-03      | 8.64E-03          | 1.72E-02         | 5.09E-02         | 4.25E-02         | 1.07E-02         | 2.15E-02 | 9.35E-02 | 7.59E-03 | 2.70E-02      | 1.66E-03                   | 5.56E-02 | 2.66E-02      | 4.26E-03         | A 25E 03         |
|      | Z-Well                    | Ê            | 6.5       | 6.5           | 6.5           | 6.5           | 6.5             | 6.5          | 6.5             | 1.3           | 6.5               | 6.5              | 6.5              | 6.5              | 6.5              | 6.5      | 6.5      | 6.5      | 1.3           | 6.5                        | 1.3      | 1.3           | 1.3              | 4.2              |
|      | X-well Y- Well Z-Well     | Ê            | 85.91     | 92.09         | 0.00          | 0.00          | 165.01          | 142.35       | 92.09           | 60.76         | 92.09             | 0.00             | 165.01           | 0.00             | 85.91            | 85.91    | 0.00     | 165.01   | 0.00          | 85.91                      | 165.01   | 85.91         | 85.91            | 85 01            |
|      | X-well                    | (E)          | 430       | 102           | 102           | 430           | 430             | 102          | 102             | 102           | 102               | 430              | 430              | 430              | 430              | 430      | 430      | 430      | 430           | 430                        | 430      | 430           | 430              | 430              |
|      | Infi                      | (m/yr)       | 0.17      | 0.46          | 0.17          | 0.46          | 0.17            | 0.17         | 0.17            | 0.17          | 0.17              | 0.17             | 0.17             | 0.17             | 0.46             | 0.46     | 0.17     | 0.46     | 0.17          | 0.17                       | 0.17     | 0.46          | 0.17             | 0 17             |
|      | Wst. Den                  | (g/cm3)      | 1.2       | 1.2           | 1.2           | 1.2           | 1.2             | 1.2          | 1.2             | 1.2           | 1.2               | 1.2              | 1.2              | 1.2              | 1.2              | 1.2      | 1.2      | 1.2      | 1.2           | 1.2                        | 1.2      | 1.2           | 1.2              | 4.5              |
|      |                           | (L/kg)       | 87.46     | 87.46         | 87.46         | 87.46         | 87.46           | 87.46        | 87.46           | 87.46         | 200.00            | 87.46            | 200.00           | 200.00           | 87.46            | 200.00   | 87.46    | 87.46    | 87.46         | 200.00                     | 87.46    | 87.46         | 87.46            | 200 00           |
|      | Wst Conc Cw / Ci Wst. Den | (mg/kg)      | 43.73     | 43.73         | 43.73         | 43.73         | 43.73           | 43.73        | 43.73           | 43.73         | 100               | 43.73            | 100              | 100              | 43.73            | 100      | 43.73    | 43.73    | 43.73         | 100                        | 43.73    | 43.73         | 43.73            | 100              |
|      | TCLP                      | (mg/L)       | 0.5       | 0.5           | 0.5           | 0.5           | 0.5             | 0.5          | 0.5             | 0.5           | 0.5               | 0.5              | 0.5              | 0.5              | 0.5              | 0.5      | 0.5      | 0.5      | 0.5           | 0.5                        | 0.5      | 0.5           | 0.5              | 0.5              |
|      | Wst. Vol                  | (m3)         | 1476      | 1476          | 1476          | 1476          | 8333.3          | 1476         | 8333.3          | 1476          | 1476              | 8333.3           | 1476             | 1476             | 8333.3           | 1476     | 1476     | 1476     | 1476          | 8333.3                     | 1476     | 1476          | 8333.3           | 1476             |
|      | Depth                     | (m)          | 2.6       | 2.6           | 2.6           | 2.6           | 2.6             | 2.6          | 2.6             | 2.6           | 2.6               | 2.6              | 2.6              | 2.6              | 2.6              | 2.6      | 5.6      | 2.6      | 2.6           | 5.6                        | 2.6      | 5.6           | 2.6              | 2 6              |
|      | Area                      | (m2)         | 20200     | 20200         | 20200         | 20200         | 162000          | 162000       | 20200           | 20200         | 20200             | 20200            | 162000           | 20200            | 20200            | 20200    | 162000   | 162000   | 20200         | 20200                      | 162000   | 20200         | 20200            | 20200            |
| 1    | Two Parameters            | at High End  | Base Case | infil & Xwell | Ywell & Xwell | Ywell & Infil | Area & Wst. Vol | Area & Xwell | Xwell & Wst Vol | Xwell & Zwell | Xwell & Wst. Conc | Ywell & Wst. Vol | Area & Wst. Conc | Ywell & Wst Conc | Infil & Wst. Vol | Sonc     | e II     |          | Ywell & Zwell | Wst. Vol & Wst. Conc 20200 | =        | Infil & Zwell | Wst. Vol & Zwell | Wst Conc & Zwell |

Table A.21 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene -- Municipal Areas- 20 year Active Life

|                      | L      |       |          |        |         |              |                           |        |        |                |        |              |      |             |      |
|----------------------|--------|-------|----------|--------|---------|--------------|---------------------------|--------|--------|----------------|--------|--------------|------|-------------|------|
|                      |        |       |          | , j    |         |              |                           |        |        |                |        | 1997         |      | 1998        |      |
| Iwo Parameters       | Area   | Depth | Wst. Vol | TCLP   | _       | ਹ<br>}<br>ਠੋ | Wst Conc Cw / Cl Wst. Den | Infil  | X-well | X-well Y- Well | Z-Well | 9-year Avg.  |      | 9-year Avg. |      |
| at High End          | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg) | (L/kg)       | (g/cm3)                   | (m/yr) | Œ      | Œ              | (E)    | Conc. (mg/L) | Rank | _           | Rank |
| Base Case            | 60705  | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.17   | 430    | 117.75         | 6.5    | 3.93E-03     |      | 5.80E-02    |      |
| Xwell & Wst Vol      | 60705  | 2:6   | 8333.3   | 1.49   | 43:73   | 29.349       | 1.2                       | 0.17   | 102    | 93.79          | 6.5    | 2.49E-02     | 22   | 4.20E-01    | -    |
| Xwell & Wst. Conc    | 60705  | 2.6   | 1476     | 1.49   | 100     | 67.11        | 1.2                       | 0.17   | 102    | 93.79          | 6.5    | 2.53E-02     | 21   | 3.04E-01    | 2    |
| TCLP & Wst. Vol      | 60705  | 2.6   | 8333.3   | 4.2    | 43.73   | 10.412       | 1.2                       | 0.17   | 430    | 117.75         | 6.5    | 3.20E-02     | 16   | 2.54E-01    | د    |
| Infil & Wst. Vol     | 60705  | 2.6   | 8333.3   | 1.49   | 43.73   | 29.349       | 1.2                       | 0.46   | 430    | 117.75         | 6.5    | 3.11E-02     | 18   | 2.50E-01    | 4    |
| Ywell & Wst. Vol     | 60705  | 2.6   | 8333.3   | 1.49   | 43.73   | 29.349       | 1.2                       | 0.17   | 430    | 0.00           | 6.5    | 4.98E-02     | 14   | 2.47E-01    | 5    |
| TCLP & xwell         | 60705  | 2.6   | 1476     | 4.2    | 43.73   | 10.41        | 1.2                       | 0.17   | 102    | 93.79          | 6.5    | 6.40E-02     | 9    | 2.31E-01    | 9    |
| Infil & Xwell        | 60705  | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.46   | 102    | 93.79          | 6.5    | 7.33E-02     | 7    | 2.15E-01    | 7    |
| Ywell & Xwell        | 60705  | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.17   | 102    | 0.00           | 6.5    | 7.69E-02     | 9    | 2.06E-01    | 8    |
| Xwell & Zwell        | 60705  | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.17   | 102    | 93.79          | 1.3    | 3.65E-02     | 15   | 1.75E-01    | 6    |
| Ywell & Wst Conc     | 60705  | 2.6   | 1476     | 1.49   | 100     | 67.11        | 1.2                       | 0.17   | 430    | 0.00           | 6.5    | 5.09E-02     | 13   | 1.73E-01    | 5    |
| Wst. Vol & Wst. Conc | 60705  | 2.6   | 8333.3   | 1.49   | 100     | 67.11        | 1.2                       | 0.17   | 430    | 117.75         | 6.5    | 1.15E-02     | 26   | 1.66E-01    | 11   |
| Infil & Wst. Conc    | 60705  | 2.6   | 1476     | 1.49   | 100     | 67.11        | 1.2                       | 0.46   | 430    | 117.75         | 6.5    | 3.08E-02     | 65   | 1.47E-01    | 12   |
| Area & Wst. Vol      | 420888 | 2.6   | 8333.3   | 1.49   | 43.73   | 29.349       | 1.2                       | 0.17   | 430    | 238.82         | 6.5    | 2.26E-01     | F    | 1.41E-01    | 13   |
| TCLP & Wst Conc      | 60705  | 2.6   | 1476     | 4.2    | 100     | 23.81        | 1.2                       | 0.17   | 430    | 117.75         | 6.5    | 3.12E-02     | 17   | 1.40E-01    | 14   |
| Ywell & TCLP         | 90209  | 2.6   | 1476     | 4.2    | 43.73   | 10.41        | 1.2                       | 0.17   | 430    | 0.00           | 6.5    | 1.23E-01     | 3    | 1.22E-01    | 15   |
| Ywell & Infil        | 90209  | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.46   | 430    | 0.00           | 6.5    | 1.15E-01     | 4    | 1.05E-01    | 16   |
| Infil & TCLP         | 60709  | 2.6   | 1476     | 4.2    | 43.73   | 10.41        | 1.2                       | 0.46   | 430    | 117.75         | 6.5    | 6.45E-02     | 6    | 7.88E-02    | 17   |
| Wst. Vol & Zwell     | 60705  | 2.6   | 8333.3   | 1.49   | 43.73   | 29.35        | 1.2                       | 0.17   | 430    | 117.75         | 1.3    | 4.79E-03     | 88   | 6.85E-02    | 18   |
| Area & Wst. Conc     | 420888 | 2.6   | 1476     | 1.49   | 100     | 67.11        | 1.2                       | 0.17   | 430    | 238.82         | 6.5    | 1.25E-01     | 2    | 6.31E-02    | 19   |
| Ywell & Zwell        | 60705  | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.17   | 430    | 0.00           | 1.3    | 2.25E-02     | 23   | 5.13E-02    | 8    |
| Area & Xwell         | 420888 | 5.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.17   | 102    | 217.62         | 6.5    | 1.15E-01     | 5    | 5.02E-02    | 21   |
| Wst Conc & Zwell     | 60705  | 2.6   | 1476     | 1.49   | 100     | 67.11        | 1.2                       | 0.17   | 430    | 117.75         | 1.3    | 4.86E-03     | 27   | 4.81E-02    | 22   |
| Infil & Zwell        | 60705  | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.46   | 430    | 117.75         | 1.3    | 1.15E-02     | 25   | 3.56E-02    | 23   |
| TCLP & Zwell         | 60705  | 2.6   | 1476     | 4.2    | 43.73   | 10.41        | 1.2                       | 0.17   | 430    | 117.75         | 1.3    | 1.18E-02     | 24   | 3.43E-02    | 24   |
| Area & Ywell         | 420888 | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.17   | 430    | 0.00           | 6.5    | 6.66E-02     | 80   | 2.93E-02    | 25   |
| ٩                    | 420888 | 2.6   | 1476     | 4.2    | 43.73   | 10.41        | 1.2                       | 0.17   | 430    | 238.82         | 6.5    | 6.35E-02     | =    | 2.84E-02    | 26   |
|                      | 420888 | 2.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.46   | 430    | 238.82         | 6.5    | 5.46E-02     | 12   | 2.26E-02    | 27   |
| Area & Zwell         | 420888 | 5.6   | 1476     | 1.49   | 43.73   | 29.35        | 1.2                       | 0.17   | 430    | 238.82         | 6.5    | 2.61E-02     | 20   | 1.73E-02    | 28   |
|                      |        |       |          |        |         |              |                           |        |        |                |        |              |      |             |      |

Table A.22 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene (TCLP = Regulatory Level) -- Municipal Areas (20 year Active Life)

|                   |        |       |          |        |                           |             |          |        |          |                |        | 1997         |     | 1998              |      |
|-------------------|--------|-------|----------|--------|---------------------------|-------------|----------|--------|----------|----------------|--------|--------------|-----|-------------------|------|
| Wo Parameters     | Area   | Depth | Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | ਹ<br>ਨ<br>ਨ | Wst. Den | Infil  | X-well   | X-well Y- Well | Z-Well | 9-year Avg.  |     | 9-year Avg.       |      |
| at High End       | (m2)   | Œ     |          | (mg/L) | (mg/kg)                   | (L/kg)      | (g/cm3)  | (m/yr) | ε        | (m)            | Œ      | Conc. (mg/L) |     | Rank Conc. (mg/L) | Rank |
|                   | 60705  | 2.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 430      | 117.75         | 6.5    | 3.93E-03     |     | 3.69E-02          |      |
| Xwell & Wst Vol   | 60709  | 2.6   | 8333.3   | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 102      | 93.79          | 6.5    | 1.66E-03     | 8   | 1.72E-01          | -    |
|                   | 60709  | 2.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.46   | 102      | 93.79          | 6.9    | 1.07E-02     | 4   | 1.61E-01          | 2    |
| Xwell & Wst. Conc | 60705  | 2.6   | 1476     | 0.5    | 100                       | 200.00      | 1.2      | 0.17   | 102      | 93.79          | 6.5    | 8.64E-03     | 15  | 1.48E-01          | m    |
|                   | 60705  | 2.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 102      | 0.00           | 6.5    | 1.73E-02     | 9   | 1.25E-01          | 4    |
| Infil & Wst. Vol  | 60705  | 2.6   | 8333.3   | 0.5    | 43.73                     | 87.46       | 1.2      | 0.46   | 430      | 117.75         | 6.9    | 1.07E-02     | 13  | 1.23E-01          | 5    |
|                   | 60705  | 2.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 102      | 93.79          | 1.3    | 8.61E-03     | 16  | 1.06E-01          | 9    |
|                   | 60705  | 5.6   | 8333.3   | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 430      | 0.00           | 6.5    | 1.72E-02     | =   | 1.04E-01          | 7    |
|                   | 420888 | 2.6   | 8333.3   | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 430      | 238.82         | 6.5    | 8.37E-02     | 6   | 9.91E-02          | 8    |
|                   | 60705  | 2.6   | 1476     | 0.5    | 100                       | 200.00      | 1.2      | 0.46   | 430      | 117.75         | 6.5    | 2.15E-02     | 6   | 9.17E-02          | 6    |
| Ywell & Wst Conc  | 60705  | 2.6   | 1476     | 0.5    | 100                       | 200.00      | 1.2      | 0.17   | 430      | 0.00           | 6.5    | 4.25E-02     | 9   | 8.78E-02          | 9    |
|                   | 60705  | 2.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.46   | 430      | 0.00           | 6.5    | 1.28E-02     | 12  | 8.29E-02          | =    |
| ouc               | 60709  | 5.6   | 8333.3   | 0.5    | 100                       | 200.00      | 1.2      | 0.17   | 430      | 117.75         | 6.5    | 1.66E-03     | 21  | 6.27E-02          | 12   |
| Area & Wst. Conc  | 420888 | 5.6   | 1476     | 0.5    | 100                       | 200.00      | 1.2      | 0.17   | 430      | 238.82         | 6.5    | 5.09E-02     | 2   | 5.50E-02          | 13   |
| -                 | 420888 | 2.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 102      | 217.62         | 6.5    | 1.19E-01     | -   | 4.79E-02          | 4    |
|                   | 60705  | 5.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 430      | 0.00           | 1.3    | 2.70E-02     | 7   | 3.25E-02          | 15   |
| Wst. Vol & Zwell  | 60705  | 2.6   | 8333.3   | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 430      | 117.75         | 1.3    | 4.26E-03     | 138 | 2.88E-02          | 16   |
| 7                 | 420888 | 2.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 430      | 0.00           | 6.5    | 9.35E-02     | 2   | 2.81E-02          | 12   |
|                   | 60709  | 5.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.46   | 430      | 117.75         | 1.3    | 2.66E-02     | 8   | 2.79E-02          | 18   |
| Wst Conc & Zwell  | 60705  | 2.6   | 1476     | 0.5    | 100                       | 200.00      | 1.2      | 0.17   | 430      | 117.75         | 1.3    | 4.25E-03     | 19  | 2.44E-02          | 19   |
| 1                 | 420888 | 2.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.46   | £4<br>38 | 238.82         | 6.5    | 7.59E-03     | 12  | 2.22E-02          | 20   |
| 7                 | 420888 | 5.6   | 1476     | 0.5    | 43.73                     | 87.46       | 1.2      | 0.17   | 430      | 238.82         | 1.3    | 5.56E-02     | 4   | 1 65E-02          | 21   |

Table A.23 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/Arsenic -- Industrial Waste Volumes (20 year Active Life)

|                      |        |       |          |        |                          |         |         |        |        |                       |        | 1997         |      | 1998         |      |
|----------------------|--------|-------|----------|--------|--------------------------|---------|---------|--------|--------|-----------------------|--------|--------------|------|--------------|------|
| Two Parameters       | Area   | Depth | Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst Den | Cw / Cl | Wst Den | Infil  | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |      | 9-year Avg.  |      |
| at High End          | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg)                  | (L/kg)  | (g/cm3) | (m/yr) | (m)    | (m)                   | (m)    | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case            | 20200  | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.17   | 430    | 85.91                 | 6.5    | 1.17E-02     |      | 6.82E-03     |      |
| Xwell & Wst Vol      | 20200  | 2.6   | 8333.3   | 13.71  | 493.3                    | 35.981  | 1.2     | 0.17   | 102    | 92.09                 | 6.5    | 1.14E-01     | 2    | 1.77E-01     | -    |
| Ywell & Wst. Vol     | 20200  | 2.6   | 8333.3   | 13.71  | 493.3                    | 35.981  | 1.2     | 0.17   | 430    | 0.00                  | 6.5    | 2.04E-01     | -    | 1.11E-01     | 2    |
| Infil & Xwell        | 20200  | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.46   | 102    | 92.09                 | 6.5    | 6.62E-02     | 7    | 6.06E-02     | 3    |
| Wst. Vol & Wst. Conc | 20200  | 2.6   | 8333.3   | 13.71  | 730                      | 53.25   | 1.2     | 0.17   | 430    | 85.91                 | 6.5    | 5.72E-02     | 6    | 5.59E-02     | 4    |
| Infil & Wst. Vol     | 20200  | 2.6   | 8333.3   | 13.71  | 493.3                    | 35.981  | 1.2     | 0.46   | 430    | 85.91                 | 6.5    | 7.63E-02     | 4    | 4.81E-02     | 5    |
| Xwell & Wst. Conc    | 20200  | 2.6   | 1476     | 13.71  | 730                      | 53.25   | 1.2     | 0.17   | 102    | 92.09                 | 6.5    | 4.47E-02     | 12   | 4.72E-02     | 9    |
| Ywell & Xwell        | 20200  | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.17   | 102    | 0.00                  | 6.5    | 9.95E-02     | က    | 4.52E-02     | 7    |
| Xwell & Zwell        | 20200  | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.17   | 102    | 92.09                 | 1.3    | 4.80E-02     | =    | 3.92E-02     | æ    |
| TCLP & Wst. Vol      | 20200  | 2.6   | 8333.3   | 34     | 493.3                    | 14.509  | 1.2     | 0.17   | 430    | 85.91                 | 6.5    | 6.00E-02     | ∞    | 3.85E-02     | 6    |
| TCLP & xwell         | 20200  | 5.6   | 1476     | 34     | 493.3                    | 14.51   | 1.2     | 0.17   | 102    | 92.09                 | 6.5    | 3.29E-02     | 13   | 3.19E-02     | 9    |
| Ywell & Wst Conc     | 20200  | 5.6   | 1476     | 13.71  | 730                      | 53.25   | 1.2     | 0.17   | 430    | 0.00                  | 6.5    | 7.49E-02     | 2    | 2.92E-02     | =    |
| Area & Wst. Vol      | 162000 | 5.6   | 8333.3   | 13.71  | 493.3                    | 35.981  | 1.2     | 0.17   | 430    | 165.01                | 6.5    | 2.73E-02     | 14   | 2.17E-02     | 12   |
| Ywell & Infil        | 20200  | 5.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.46   | 430    | 0.00                  | 6.5    | 6.71E-02     | 9    | 2.06E-02     | 13   |
| Ywell & TCLP         | 20200  | 5.6   | 1476     | 34     | 493.3                    | 14.51   | 1.2     | 0.17   | 430    | 0.00                  | 6.5    | 5.38E-02     | 10   | 1.98E-02     | 4    |
| Wst. Vol & Zwell     | 20200  | 2.6   | 8333.3   | 13.71  | 493.3                    | 35.98   | 1.2     | 0.17   | 430    | 85.91                 | 1.3    | 1.96E-02     | 11   | 1.87E-02     | 15   |
| Infil & Wst. Conc    | 20200  | 2.6   | 1476     | 13.71  | 730                      | 53.25   | 1.2     | 0.46   | 430    | 85.91                 | 6.5    | 2.34E-02     | 16   | 1.26E-02     | 16   |
| TCLP & Wst Conc      | 20200  | 2.6   | 1476     | 34     | 730                      | 21.47   | 1.2     | 0.17   | 430    | 85.91                 | 6.5    | 1.76E-02     | 18   | 1.01E-02     | 17   |
| Area & Xwell         | 162000 | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.17   | 102    | 142.35                | 6.5    | 9.76E-03     | 50   | 9.99E-03     | 18   |
| Yweil & Zweli        | 20200  | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.17   | 430    | 00.0                  | 1.3    | 2.45E-02     | 15   | 9.92E-03     | 19   |
| Infil & TCLP         | 20200  | 2.6   | 1476     | 34     | 493.3                    | 14.51   | 1.2     | 0.46   | 430    | 85.91                 | 6.5    | 1.61E-02     | 18   | 8.54E-03     | 20   |
| Area & Wst. Conc     | 162000 | 2.6   | 1476     | 13.71  | 730                      | 53.25   | 1.2     | 0.17   | 430    | 165.01                | 6.5    | 7.16E-03     | 22   | 5.70E-03     | 21   |
| Wst Conc & Zwell     | 20200  | 2.6   | . 1476   | 13.71  | 730                      | 53.25   | 1.2     | 0.17   | 430    | 85.91                 | 1.3    | 7.17E-03     | 21   | 4.96E-03     | 22   |
| Area & Ywell         | 162000 | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.17   | 430    | 0.00                  | 6.5    | 5.25E-03     | 24   | 4.67E-03     | 23   |
| Area & Infil         | 162000 | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.46   | 430    | 165.01                | 6.5    | 4.95E-03     | 56   | 4.29E-03     | 24   |
| Infil & Zwell        | 20200  | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.46   | 430    | 85.91                 | 1.3    | 6.66E-03     | 23   | 3.98E-03     | 25   |
| Area & TCLP          | 162000 | 2.6   | 1476     | 34     | 493.3                    | 14.51   | 1.2     | 0.17   | 430    | 165.01                | 6.5    | 4.84E-03     | 27   | 3.85E-03     | 56   |
| TCLP & Zwell         | 20200  | 5.6   | 1476     | 34     | 493.3                    | 14.51   | 1.2     | 0.17   | 430    | 85.91                 | 1.3    | 5.15E-03     | 22   | 3.35E-03     | 27   |
| Area & Zwell         | 162000 | 2.6   | 1476     | 13.71  | 493.3                    | 35.98   | 1.2     | 0.17   | 430    | 165.01                | 1.3    | 2.11E-03     | 28   | 2.07E-03     | 28   |
|                      |        |       |          |        |                          |         |         |        |        |                       |        |              |      |              |      |

Table A.24 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/TC Capped Arsenic -- Industrial Areas (20 year Active Life)

| Two Parameters         | -      |       |                |        |                                |          |          |        |        |                       |        | 1997              |      | 1998         |      |
|------------------------|--------|-------|----------------|--------|--------------------------------|----------|----------|--------|--------|-----------------------|--------|-------------------|------|--------------|------|
| t High End             | Area   | Depth | Depth Wst. Vol | TCLP   | TCLP Wst Conc Cw / Cl Wst. Den | <u> </u> | Wst. Den | Infil  | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.       |      | 9-year Avg.  |      |
|                        | (m2)   | (E)   | (m3)           | (mg/L) | (mg/kg)                        | (L/kg)   | (g/cm3)  | (m/yr) | (E)    | (£)                   | Ξ      | Conc. (mg/L) Rank | Rank | Conc. (mg/L) | Rank |
| Base Case              | 20200  | 2.6   | 1476           | 2      | 493.3                          | 98.66    | 1.2      | 0.17   | 430    | 85.91                 | 6.5    | 1.03E-02          |      | 6.81E-03     |      |
|                        | 20200  | 2.6   | 8333.3         | 5      | 493.3                          | 98.66    | 1.2      | 0.17   | 102    | 92.09                 | 6.5    | 6.30E-02          | 4    | 1.63E-01     | -    |
| Ywell & Wst. Vol       | 20200  | 2.6   | 8333.3         | 5      | 493.3                          | 98.66    | 1.2      | 0.17   | 430    | 0.00                  | 6.5    | 1.18E-01          | -    | 1.05E-01     | 2    |
| ınfil & Xwell          | 20200  | 2.6   | 1476           | 2      | 493.3                          | 98.66    | 1.2      | 0.46   | 102    | 92.09                 | 6.5    | 5.92E-02          | 9    | 6.05E-02     | 3    |
| Wst. Vol & Wst. Conc 7 | 20200  | 2.6   | 8333.3         | 5      | 730                            | 146.00   | 1.2      | 0.17   | 430    | 85.91                 | 6.5    | 3.05E-02          | 9    | 5.10E-02     | 4    |
| Infil & Wst. Vol       | 20200  | 2.6   | 8333.3         | 2      | 493.3                          | 98.66    | 1.2      | 0.46   | 430    | 85.91                 | 6.5    | 5.28E-02          | 7    | 4.75E-02     | 5    |
| Xwell & Wst. Conc      | 20200  | 2.6   | 1476           | 5      | 730                            | 146.00   | 1.2      | 0.17   | 102    | 60.76                 | 6.5    | 3.43E-02          | 6    | 4.68E-02     | 9    |
|                        | 20200  | 2.6   | 1476           | . 9    | 493.3                          | 98.66    | 1.2      | 0.17   | 102    | 0.00                  | 6.5    | 8.29E-02          | 2    | 4.50E-02     | _    |
|                        | 20200  | 2.6   | 1476           | 5      | 493.3                          | 98.66    | 1.2      | 0.17   | 102    | 92.09                 | 1.3    | 3.98E-02          | 8    | 3.91E-02     | 80   |
| Ywell & Wst Conc       | 20200  | 2.6   | 1476           | 2      | 730                            | 146.00   | 1.2      | 0.17   | 430    | 0.00                  | 6.5    | 6.04E-02          | 5    | 2.91E-02     | 6    |
| . Vol                  | 162000 | 2.6   | 8333.3         | 5      | 493.3                          | 98.66    | 1.2      | 0.17   | 430    | 165.01                | 6.5    | 2.73E-02          | 11   | 2.17E-02     | 9    |
|                        | 20200  | 2.6   | 1476           | 5      | 493.3                          | 98.66    | 1.2      | 0.46   | 430    | 0.00                  | 6.5    | 6.36E-02          | m    | 2.04E-02     | =    |
| <i>a</i>               | 20200  | 2.6   | 8333.3         | 2      | 493.3                          | 98.66    | 1.2      | 0.17   | 430    | 85.91                 | 1.3    | 1.14E-02          | 4    | 1.78E-02     | 12   |
| Infil & Wst. Conc      | 20200  | 2.6   | 1476           | 2      | 730                            | 146.00   | 1.2      | 0.46   | 430    | 85.91                 | 6.5    | 2.14E-02          | 12   | 1.26E-02     | 13   |
|                        | 162000 | 5.6   | 1476           | 2      | 493.3                          | 98.66    | 1.2      | 0.17   | 102    | 142.35                | 6.5    | 9.75E-03          | 15   | 9.99E-03     | 4    |
|                        | 20200  | 2.6   | 1476           | 2      | 493.3                          | 98.66    | 1.2      | 0.17   | 430    | 0.00                  | 1.3    | 2.13E-02          | 13   | 9.90E-03     | 15   |
| Area & Wst. Conc   10  | 162000 | 2.6   | 1476           | 2      | 730                            | 146.00   | 1.2      | 0.17   | 430    | 165.01                | 6.5    | 7.16E-03          | 16   | 5.69E-03     | 16   |
| Wst Conc & Zwell 2     | 20200  | 2.6   | 1476           | 2      | 730                            | 146.00   | 1.2      | 0.17   | 430    | 85.91                 | 1.3    | 5.76E-03          | 18   | 4.93E-03     | 17   |
| Area & Ywell           | 162000 | 2.6   | 1476           | 2      | 493.3                          | 98.66    | 1.2      | 0.17   | 430    | 0.00                  | 6.5    | 5.25E-03          | 19   | 4.67E-03     | 18   |
| Area & Infil 10        | 162000 | 2.6   | 1476           | 5      | 493.3                          | 98.66    | 1.2      | 0.46   | 430    | 165.01                | 6.5    | 4.95E-03          | 82   | 4.29E-03     | 19   |
|                        | 20200  | 2.6   | 1476           | 5      | 493.3                          | 98.66    | 1.2      | 0.46   | 430    | 85.91                 | 1.3    | 6.32E-03          | 17   | 3.98E-03     | 8    |
| Area & Zwell           | 162000 | 5.6   | 1476           | 2      | 493.3                          | 98.66    | 1.2      | 0.17   | 430    | 165.01                | 1.3    | 2.11E-03          | 21   | 2.07E-03     | 21   |

Table A.25 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/Arsenic, -- Municipal Areas- 20 Year Active Life

|                      |        |       |          |        |                           |                 |         |        |        |                       |        | 2007         |      |              |      |
|----------------------|--------|-------|----------|--------|---------------------------|-----------------|---------|--------|--------|-----------------------|--------|--------------|------|--------------|------|
| !                    | ,      |       |          |        |                           |                 |         | -      |        |                       |        | /661         |      | 1998         |      |
| Two Parameters       | Area   | Depth | Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | <u>ਹ</u><br>/ ≫ |         |        | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |      | 9-year Avg.  |      |
| at High End          | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg)                   | (Ukg)           | (g/cm3) | (m/yr) | (m)    | (m)                   | (m)    | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case            | 60705  | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.17   | 430    | 117.75                | 6.5    | 1.17E-02     |      | 5.50E-03     |      |
| Xwell & Wst Vol      | 60705  | 5.6   | 8333.3   | 13.71  | 493.3                     | 35.981          | 1.2     | 0.17   | 102    | 93.79                 | 6.5    | 1.14E-01     | 2    | 1.18E-01     | -    |
| Ywell & Wst. Vol     | 60705  | 2.6   | 8333.3   | 13.71  | 493.3                     | 35.981          | 1.2     | 0.17   | 430    | 0.00                  | 6.5    | 2.04E-01     | -    | 5.52E-02     | 2    |
| Wst. Vol & Wst. Conc | 60709  | 2.6   | 8333.3   | 13.71  | 730                       | 53.25           | 1.2     | 0.17   | 430    | 117.75                | 6.5    | 5.72E-02     | 6    | 4.58E-02     | 3    |
| Infil & Wst. Vol     | 60705  | 2.6   | 8333.3   | 13.71  | 493.3                     | 35.981          | 1.2     | 0.46   | 430    | 117.75                | 6.5    | 7.63E-02     | 4    | 3.66E-02     | 4    |
| TCLP & Wst. Vol      | 60705  | 2.6   | 8333.3   | 34     | 493.3                     | 14.509          | 1.2     | 0.17   | 430    | 117.75                | 6.5    | 6.00E-02     | 80   | 3.10E-02     | 5    |
| Xwell & Wst. Conc    | 60705  | 2.6   | 1476     | 13.71  | 730                       | 53.25           | 1.2     | 0.17   | 102    | 93.79                 | 6.5    | 4.47E-02     | 12   | 3.10E-02     | 9    |
| Infil & Xwell        | 60705  | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.46   | 102    | 217.62                | 6.5    | 6.62E-02     | 7    | 2.80E-02     | 7    |
| Ywell & Xwell        | 60705  | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.17   | 102    | 0.00                  | 6.5    | 9.95E-02     | 3    | 2.28E-02     | 80   |
| TCLP & xwell         | 60705  | 2.6   | 1476     | 34     | 493.3                     | 14.51           | 1.2     | 0.17   | 102    | 93.79                 | 6.5    | 3.29E-02     | 13   | 2.10E-02     | 6    |
| Xwell & Zwell        | 60705  | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.17   | 102    | 93.79                 | 1.3    | 4.80E-02     | =    | 2.01E-02     | 2    |
| Wst. Vol & Zwell     | 60705  | 2.6   | 8333.3   | 13.71  | 493.3                     | 35.98           | 1.2     | 0.17   | 430    | 117.75                | 1.3    | 1.96E-02     | 12   | 1.57E-02     | =    |
| Ywell & Wst Conc     | 90209  | 2.6   | 1476     | 13.71  | 730                       | 53.25           | 1.2     | 0.17   | 430    | 0.00                  | 6.5    | 7.49E-02     | ည    | 1.45E-02     | 12   |
| Area & Wst. Vol      | 420888 | 2.6   | 8333.3   | 13.71  | 493.3                     | 35.981          | 1.2     | 0.17   | 430    | 238.82                | 6.5    | 2.73E-02     | 4    | 1.17E-02     | 13   |
| Ywell & TCLP         | 60705  | 2.6   | 1476     | 34     | 493.3                     | 14.51           | 1.2     | 0.17   | 430    | 0.00                  | 6.5    | 5.38E-02     | 5    | 9.79E-03     | 14   |
| Infil & Wst. Conc    | 90209  | 2.6   | 1476     | 13.71  | 730                       | 53.25           | 1.2     | 0.46   | 430    | 238.82                | 6.5    | 2.34E-02     | 16   | 9.61E-03     | 15   |
| Ywell & Infil        | 60709  | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.46   | 430    | 0.00                  | 6.5    | 6.71E-02     | 9    | 9.37E-03     | 16   |
| TCLP & Wst Conc      | 60705  | 2.6   | 1476     | 34     | 730                       | 21.47           | 1.2     | 0.17   | 430    | 238.82                | 6.5    | 1.76E-02     | 18   | 8.13E-03     | 17   |
| Infil & TCLP         | 90209  | 2.6   | 1476     | 34     | 493.3                     | 14.51           | 1.2     | 0.46   | 430    | 117.75                | 6.5    | 1.61E-02     | 13   | 6.49E-03     | 18   |
| Ywell & Zwell        | 90709  | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.17   | 430    | 0.00                  | 1.3    | 2.45E-02     | 15   | 4.93E-03     | 19   |
| Wst Conc & Zwell     | 90209  | 2.6   | 1476     | 13.71  | 730                       | 53.25           | 1.2     | 0.17   | 430    | 117.75                | 1.3    | 7.17E-03     | 21   | 4.12E-03     | 8    |
| Area & Xwell         | 420888 | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.17   | 102    | 217.62                | 6.5    | 9.76E-03     | 8    | 3.83E-03     | 21   |
| ,                    | 60705  | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.46   | 430    | 238.82                | 1.3    | 6.66E-03     | 23   | 3.21E-03     | 22   |
| Area & Wst. Conc     | 420888 | 2.6   | 1476     | 13.71  | 730                       | 53.25           | 1.2     | 0.17   | 430    | 238.82                | 6.5    | 7.16E-03     | 22   | 3.05E-03     | 23   |
|                      | 60705  | 2.6   | 1476     | 34     | 493.3                     | 14.51           | 1.2     | 0.17   | 430    | 117.75                | 1.3    | 5.15E-03     | 22   | 2.79E-03     | 24   |
|                      | 420888 | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.17   |        | 0.00                  | . 2.9  | 5.25E-03     | 24   | 2.14E-03     | 22   |
| Ъ                    | 420888 | 2.6   |          | 34     | 493.3                     | 14.51           | 1.2     | 0.17   | -      | 238.82                | 6.5    | 4.84E-03     | 27   | 2.06E-03     | 26   |
|                      | 420888 | 2.6   |          | 13.71  |                           | 35.98           | 1.2     | 0.46   |        | 238.82                | 6.5    | 4.95E-03     | 26   | 1.93E-03     | 27   |
| Area & Zwell         | 420888 | 2.6   | 1476     | 13.71  | 493.3                     | 35.98           | 1.2     | 0.17   | 430    | 238.82                | 6.5    | 2.11E-03     | 28   | 1.28E-03     | 78   |
|                      |        |       |          |        |                           |                 |         |        |        |                       |        |              |      |              |      |

Table A.26 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/TC Capped Arsenic - Municipal Areas- 20 Year Active Life

| Two Parameters       | Area   | Area Denth Wet | >      | Ç      |                           | Č      |           |        |        |                       |        | 1997         | Γ     | 1998                           |      |
|----------------------|--------|----------------|--------|--------|---------------------------|--------|-----------|--------|--------|-----------------------|--------|--------------|-------|--------------------------------|------|
| at High End          | (m)    | 1              | ۶ ۰    | ן כר   | Wat conc cw / Ci Wat. Den |        | Wst. Den  | Infi   | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |       | 9-year Avg.                    |      |
| Boso Coop            | (2111) | 4              | (ciii) | (mg/L) | (mg/L) (mg/kg)            | (∐kg)  | (g/cm3)   | (m/yr) | Ξ      | Œ)                    | Œ      | Conc. (mg/L) | Rank  | Conc. (mg/L) Rank Conc. (mg/L) | Rank |
| Dase Case            | C0/09  | 5.6            | 1476   | သ      | 493.3                     | 98.66  | 1.2       | 0.17   | 430    | 117.75                | 6.5    | 1 03E-02     | I     | F 40E 02                       |      |
| Xwell & Wst Vol      | 60705  | 2.6            | 8333.3 | 5      | 493.3                     | 98.66  | 12        | 0 17   | 102    | 03 70                 | 2 0    | 20 100 0     |       | 0.49E-U3                       |      |
| Ywell & Wst. Vol     | 60705  | 2.6            | 8333.3 | 2      | 493.3                     | 98 66  | 1,5       | 0 47   | 1      | 20.00                 | 0.0    | 0.30E-02     | 4     | 1.17E-01                       | -    |
| Wst. Vol & Wst. Conc | 60705  | 26             |        | ď      | 730                       | 746.00 | 1         | 3 !    | 25     | 0.00                  | 6.5    | 1.18E-01     | 1     | 5.49E-02                       | 7    |
| Infil & Wst Voi      |        |                |        | ,      | 900                       | 140.00 | 7.1       | 0.17   | 430    | 117.75                | 6.5    | 3.05E-02     | 10    | 4.53E-02                       | 6    |
| Xwell & Wst Conc     | 80705  | 0.7            | 0253.3 | 0      | 493.3                     | 98.66  | 1.2       | 0.46   | 430    | 117.75                | 6.5    | 5.28E-02     | ~     | 3.66E-02                       | 4    |
| Infil & Xwell        | 80705  | 0.7            | 14/0   | o (    | 730                       | 146.00 | 1.2       | 0.17   | 102    | 93.79                 | 6.5    | 3.43E-02     | 6     | 3.10E-02                       | 5    |
| Ywell & Xwell        | 20709  | 0.0            | 0/4/0  | ، ا    | 493.3                     | 98.66  | 1.2       | 0.46   | 102    | 93.79                 | 6.5    | 5.92E-02     | 9     | 2.80E-02                       | 9    |
| Yungil 8 Zungil      | 20,000 | 0.7            | 4/0    | o      | 493.3                     | 98.66  | 1.2       | 0.17   | 102    | 0.00                  | 6.5    | 8.29E-02     | 2     | 2.28E-02                       | 7    |
| Well & Zwell         | 50/09  | 5.6            | 1476   | 5      | 493.3                     | 98.66  | 1.2       | 0.17   | 102    | 93.79                 | 1.3    | 3.98E-02     | ·     | 2.01F-02                       | . α  |
| WSI. VOI & ZWEII     | 60705  | 2.6            | 8333.3 | တ      | 493.3                     | 98.66  | 1.2       | 0.17   | 430    | 117.75                | 1.3    | 1 14F-02     | 1     | 1 565 00                       | ,    |
| Ywell & Wst Conc     | 60705  | 2.6            | 1476   | 5      | 730                       | 146.00 | 12        | 0.17   | 430    | 9                     | 8 5    | 604500       |       | 1.30E-02                       | n    |
| Area & Wst. Vol      | 420888 | 2.6            | 8333.3 | 5      | 403 3                     | 99 80  | ,         | ;      | 3 3    | 3 3                   | 3      | 0.04E-02     | n     | 1.45E-02                       | 9    |
| Infil & Wst. Conc    | 60705  | 26             | 1176   | , 4    | 495                       | 30.00  | 3 .       | 7      | 55     | 238.82                | 6.5    | 2.73E-02     | =     | 1.17E-02                       | =    |
| Ywell & Infil        | 80705  | 0 0            | 0/4    | 0      | 25                        | 146.00 | 1.2       | 0.46   | 430    | 117.75                | 6.5    | 2.14E-02     | 12    | 9.60E-03                       | 12   |
| W                    | 20,00  | 0.7            | 14/0   | ٥      | 493.3                     | 98.66  | 1.2       | 0.46   | 430    | 0.00                  | 6.5    | 6.36E-02     | 3     | 9 30F-03                       | 73   |
| Ywell & Zwell        | 60705  | 5.6            | 1476   | 2      | 493.3                     | 98.66  | 1.2       | 0.17   | 430    | 0.00                  | 13     | 2 13E-02     | , 5   | 4 02E 03                       | 2 ;  |
| Wst Conc & Zwell     | 60705  | 5.6            | 1476   | 5      | 730                       | 146.00 | 1.2       | 0.17   | 430    | 117 75                | 23     | 5 76E 02     | 2   0 | 4.35E-03                       | 4 1  |
| =                    | 420888 | 2.6            | 1476   | 2      | 493.3                     | 98.66  | $\dagger$ | 0 17   | 1      | 217 62                | 2 4    | 0.75E-03     | ١     | 4.12E-03                       | 2    |
| Infil & Zwell        | 60705  | 2.6            | 1476   | 5      | 493.3                     | 98 66  | $\dagger$ | 0.46   | +      | 447 75                |        | 9.735-03     | Ω !   | 3.83E-03                       | 16   |
| Area & Wst. Conc     | 420888 | 26             | 1476   | u      | 1                         | 300    | †         | 2      | 7      | 0/:/2                 | ?      | 6.32E-U3     | 17    | 3.16E-03                       | 17   |
| T                    | 420000 | 2 6            | 2 5    | ,      | ┪                         | 140.00 | 1.2       | 0.17   | 430    | 238.82                | 6.5    | 7.16E-03     | 16    | 3.05E-03                       | 18   |
| 5                    | 44000  | 0.0            | 14/6   | 2      | 493.3                     | 98.66  | 1.2       | 0.17   | 430    | 0.00                  | 6.5    | 5.25E-03     | 19    | 2 14F-03                       | þ    |
|                      | 420888 | 2.6            | 1476   | 2      | 493.3                     | 98.66  | 1.2       | 0.46   | 430    | 238.82                | 6.5    | 4 95F-03     | ١     | 1 03E 03                       | 2 6  |
| Area & Zwell         | 420888 | 2.6            | 1476   | 2      | 493.3                     | 98.66  | 12        | 0.17   | 430    | 238 82                | 2      | 2 44 5 03    | 3 2   | 1.93E-03                       | 3    |
|                      |        |                |        |        | 1                         | 1      | 1         |        | ┑      | 7                     | ?      | 2.115        | 17    | 1.28E-03                       | 21   |

Table A.27 Sensitivity Analysis for Unleaded Gasoline tank sediment Off-site Industrial Landfill Scenario/ Benzene (20 Year Active Life)

|                      |        |       |          |        |                           |             |          |        | -      |                       |        | 1998         |      |
|----------------------|--------|-------|----------|--------|---------------------------|-------------|----------|--------|--------|-----------------------|--------|--------------|------|
| Two Parameters       | Area   | Depth | Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | ਹ<br>}<br>ਠ | Wst. Den | Iufi   | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |      |
| at High End          | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg)                   | (Ukg)       | (g/cm3)  | (m/yr) | (m)    | Œ                     | (E)    | Conc. (mg/L) | Rank |
| Base Case            | 20200  | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.17   | 430    | 85.91                 | 6.5    | 6.69E-03     |      |
| Xwell & Wst Vol      | 20200  | 2.6   | 1038.57  | 0.75   | 51.9                      | 69.2        | 1.4      | 0.17   | 102    | 92.09                 | 6.5    | 9.94E-02     | -    |
| Ywell & Wst. Vol     | 20200  | 2.6   | 1038.57  | 0.75   | 51.9                      | 69.2        | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 7.94E-02     | 2    |
| Infil & Wst. Vol     | 20200  | 2.6   | 1038.57  | 0.75   | 51.9                      | 69.2        | 1.4      | 0.46   | 430    | 85.91                 | 6.5    | 5.41E-02     | 3    |
| Xwell & Wst. Conc    | 20200  | 2.6   | 89.29    | 0.75   | 110                       | 146.67      | 1.4      | 0.17   | 102    | 92.09                 | 6.5    | 4.70E-02     | 4    |
| Area & Wst. Vol      | 162000 | . 2.6 | 1038.57  | 0.75   | 51.9                      | 69.2        | 1.4      | 0.17   | 430    | 165.01                | 6.5    | 4.50E-02     | 5    |
| TCLP & Wst. Vol      | 20200  | 2.6   | 1038.57  | 1.6    | 51.9                      | 32.438      | 1.4      | 0.17   | 430    | 85.91                 | 6.5    | 4.47E-02     | 9    |
| Infil & Xwell        | 20200  | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 4.1      | 0.46   | 102    | 92.09                 | 6.5    | 3.80E-02     | 7    |
| Ywell & Xwell        | 20200  | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.17   | 102    | 0.00                  | 6.5    | 3.79E-02     | 80   |
| Ywell & Wst Conc     | 20200  | 2.6   | 89.29    | 0.75   | 110                       | 146.67      | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 3.50E-02     | თ    |
| Wst. Vol & Wst. Conc | 20200  | 2.6   | 1038.57  | 0.75   | 110                       | 146.67      | 1.4      | 0.17   | 430    | 85.91                 | 6.5    | 3.25E-02     | 9    |
| Xwell & Zwell        | 20200  | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.17   | 102    | 92.09                 | 1.3    | 3.21E-02     | E    |
| TCLP & xwell         | 20200  | 2.6   | 89.29    | 1.6    | 51.9                      | 32.44       | 1.4      | 0.17   | 102    | 92.09                 | 6.5    | 2.87E-02     | 12   |
| Ywell & TCLP         | 20200  | 2.6   | 89.29    | 1.6    | 51.9                      | 32.44       | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 2.04E-02     | 13   |
| Ywell & Infil        | 20200  | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.46   | 430    | 0.00                  | 6.5    | 1.96E-02     | 44   |
| Infil & Wst. Conc    | 20200  | 2.6   | 89.29    | 0.75   | 110                       | 146.67      | 1.4      | 0.46   | 430    | 85.91                 | 6.5    | 1.69E-02     | 15   |
| TCLP & Wst Conc      | 20200  | 2.6   | 89.29    | 1.6    | 110                       | 68.75       | 1.4      | 0.17   | 430    | 85.91                 | 6.5    | 1.42E-02     | 16   |
| Wst. Vol & Zwell     | 20200  | 2.6   | 1038.57  | 0.75   | 51.9                      | 69.20       | 1.4      | 0.17   | 430    | 85.91                 | 1.3    | 1.33E-02     | 17   |
| Area & Xwell         | 162000 | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.17   | 102    | 142.35                | 6.5    | 1.02E-02     | 18   |
| Ywell & Zwell        | 20200  | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.17   | 430    | 0.00                  | 1.3    | 9.55E-03     | 19   |
| Area & Wst. Conc     | 162000 | 2.6   | 89.29    | 0.75   | 110                       | 146.67      | 1.4      | 0.17   | 430    | 165.01                | 6.5    | 9.06E-03     | 8    |
| Infil & TCLP         | 20200  | 2.6   | 89.29    | 1.6    | 51.9                      | 32.44       | 1.4      | 0.46   | 430    | 85.91                 | 6.5    | 8.51E-03     | 21   |
| Wst Conc & Zwell     | 20200  | 2.6   | 89.29    | 0.75   | 110                       | 146.67      | 1.4      | 0.17   | 430    | 85.91                 | 1.3    | 5.88E-03     | 22   |
|                      | 162000 | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 4.       | 0.17   | 430    | 0.00                  | 6.5    | 5.22E-03     | 23   |
| ГР                   | 162000 | 2.6   | 89.29    | 1.6    | 51.9                      | 32.44       | 1.4      | 0.17   | 430    | 165.01                | 6.5    | 4.32E-03     | 24   |
| Area & Infil         | 162000 | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.46   | 430    | 165.01                | 6.5    | 4.21E-03     | 25   |
| Infil & Zwell        | 20200  | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.46   | 430    | 85.91                 | 1.3    | 3.79E-03     | 56   |
| TCLP & Zwell         | 20200  | 2.6   | 89.29    | 1.6    | 51.9                      | 32.44       | 1.4      | 0.17   | 430    | 85.91                 | 1.3    | 3.44E-03     | 27   |
| Area & Zwell         | 162000 | 2.6   | 89.29    | 0.75   | 51.9                      | 69.20       | 1.4      | 0.17   | 430    | 165.01                | 6.5    | 2.28E-03     | 28   |

Table A.28 Sensitivity Analysis for Unleaded Gasoline tank sediment Off-site Industrial Landfill Scenario/TC Capped Benzene (20 year Active Life)

| !                    |        |       |          |        |                  |        |          |        |        |                       |        | 1998         |      |
|----------------------|--------|-------|----------|--------|------------------|--------|----------|--------|--------|-----------------------|--------|--------------|------|
| Two Parameters       | Area   | Depth | Wst. Voi | TCLP   | Wst Conc Cw / Cl |        | Wst. Den | Iufil  | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |      |
| at High End          | (m2)   | (E)   | (m3)     | (mg/L) | (mg/kg)          | (L/kg) | (g/cm3)  | (m/yr) | Œ      | (m)                   | (m)    | Conc. (mg/L) | Rank |
| Base Case            | 20200  | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 4.1      | 0.17   | 430    | 85.91                 | 6.5    | 6.26E-03     |      |
| Xwell & Wst Vol      | 20200  | 2.6   | 1038.57  | 0.5    | 51.9             | 103.8  | 4.1      | 0.17   | 102    | 60.76                 | 6.5    | 7.24E-02     | -    |
| Ywell & Wst. Vol     | 20200  | 2.6   | 1038.57  | 0.5    | 51.9             | 103.8  | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 5.85E-02     | 2    |
| Infil & Wst. Vol     | 20200  | 2.6   | 1038.57  | 0.5    | 51.9             | 103.8  | 1.4      | 0.46   | 430    | 85.91                 | 6.5    | 4.26E-02     | m    |
| Area & Wst. Vol      | 162000 | 2.6   | 1038.57  | 0.5    | 51.9             | 103.8  | 1.4      | 0.17   | 430    | 165.01                | 6.5    | 4.11E-02     | 4    |
| Xwell & Wst. Conc    | 20200  | 2.6   | 89.29    | 0.5    | 110              | 220.00 | 4.1      | 0.17   | 102    | 60.76                 | 6.5    | 4.00E-02     | 2    |
| Infil & Xwell        | 20200  | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 1.4      | 0.46   | 102    | 60.76                 | 6.5    | 3.72E-02     | 9    |
| Ywell & Xwell        | 20200  | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 1.4      | 0.17   | 102    | 0.00                  | 6.5    | 3.49E-02     | _    |
| Ywell & Wst Conc     | 20200  | 2.6   | 89.29    | 0.5    | 110              | 220.00 | 4.       | 0.17   | 430    | 0.00                  | 6.5    | 3.04E-02     | 80   |
| Xwell & Zwell        |        | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 1.4      | 0.17   | 102    | 60.76                 | 1.3    | 2.95E-02     | 6    |
| Wst. Vol & Wst. Conc | 20200  | 2.6   | 1038.57  | 0.5    | 110              | 220.00 | 1.4      | 0.17   | 430    | 85.91                 | 6.5    | 2.30E-02     | 10   |
| Ywell & Infil        | 20200  | 2.6   | 89.29    | 9.0    | 51.9             | 103.80 | 1.4      | 0.46   | 430    | 0.00                  | 6.5    | 1.94E-02     | =    |
| Infil-& Wst. Conc    | 20200  | 2.6   | 89.29    | 0.5    | 110              | 220.00 | 1.4      | 0.46   | 430    | 85.91                 | 6.5    | 1.59E-02     | 12   |
| Area & Xwell         | 162000 | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 1.4      | 0.17   | 102    | 142.35                | 6.5    | 1.02E-02     | 13   |
| Wst. Vol & Zwell     | 20200  | 2.6   | 1038.57  | 0.5    | 51.9             | 103.80 | 1.4      | 0.17   | 430    | 85.91                 | 1.3    | 9.80E-03     | 14   |
| Area & Wst. Conc     | 162000 | 2.6   | 89.29    | 0.5    | 110              | 220.00 | 4.1      | 0.17   | 430    | 165.01                | 6.5    | 8.96E-03     | 15   |
| Ywell & Zwell        | 20200  | 5.6   | 89.29    | 0.5    | 51.9             | 103.80 | 1.4      | 0.17   | 430    | 0.00                  | 1.3    | 8.92E-03     | 16   |
| Area & Ywell         | 162000 | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 5.18E-03     | 17   |
| Wst Conc & Zwell     | 20200  | 5.6   | 89.29    | 0.5    | 110              | 220.00 | 4.7      | 0.17   | 430    | 85.91                 | 1.3    | 5.10E-03     | 18   |
| Area & Infil         | 162000 | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 1.4      | 0.46   | 430    | 165.01                | 6.5    | 4.15E-03     | 19   |
| Infil & Zwell        | 20200  | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 4.1      | 0.46   | 430    | 85.91                 | 1.3    | 3.72E-03     | 20   |
| Area & Zwell         | 162000 | 2.6   | 89.29    | 0.5    | 51.9             | 103.80 | 4.       | 0.17   | 430    | 165.01                | 1.3    | 2.26E-03     | 21   |

Table A.29 Sensitivity Analysis for Unleaded Gasoline tank sediment Off-site Municipal Landfill Scenario/ Benzene (20 Year Active Life)

| Area Depth         Wet. Vol         TCLP           digh End         (m2)         (m)         (m3)         (mg/L)           def         60705         2.6         89.29         0.75           fet Vol         60705         2.6         1038.57         0.75           fet Vol         60705         2.6         1038.57         0.75           ft Vol         60705         2.6         1038.57         0.75           ft Vol         60705         2.6         1038.57         0.75           gt Vol         60705         2.6         1038.57         0.75           st Conc         60705         2.6         1038.57         0.75           st Conc         60705         2.6         89.29         0.75           well         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         1.6           conc         60705         2.6         89.29         1.6           st Conc         60705         2.6         89.29         1.6           dell         60705         2.6         89.   | -         | Wst Conc Cw / Cl Wst Den |            | Infil  | Hour. | Y. Well | X-well Y- Well Z-Well |              |      |
|--|-----------|--------------------------|------------|--------|-------|---------|-----------------------|--------------|------|
| Str. Vol.   (M07)   (M3)   (M07)   (M3)   (M07)  | _         |                          |            |        |       |         |                       | 9-year Avg.  | į    |
| ee         60705         2.6         89.29         0.75           fst Vol         60705         2.6         1038.57         0.75           vst. Vol         60705         2.6         1038.57         0.75           k Wst. Conc         60705         2.6         1038.57         0.75           k Wst. Conc         60705         2.6         1038.57         0.75           st. Vol         60705         2.6         1038.57         0.75           st. Conc         60705         2.6         1038.57         0.75           st. Vol         60705         2.6         89.29         0.75           well         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         0.75           st Conc <t< th=""><th></th><th>(L/kg)</th><th>(g/cm3) (t</th><th>(m/yr)</th><th>Ē</th><th>Ξ</th><th>Ξ</th><th>Conc. (mg/L)</th><th>Rank</th></t<>  |           | (L/kg)                   | (g/cm3) (t | (m/yr) | Ē     | Ξ       | Ξ                     | Conc. (mg/L) | Rank |
| (st Vol         60705         2.6         1038.57         0.75           4/st. Vol         60705         2.6         1038.57         0.75           8. Wst. Conc         60705         2.6         1038.57         0.75           8. Wst. Conc         60705         2.6         1038.57         0.75           8.t. Vol         60705         2.6         1038.57         0.75           8.t. Vol         42088         2.6         1038.57         0.75           8.t. Vol         60705         2.6         89.29         0.75           8.t. Conc         60705         2.6         89.29         0.75  |           | 69.20                    | 4.1        | 0.17   | 430   | 117.75  | 6.5                   | 5.86E-03     |      |
| Vest. Vol         60705         2.6         1038.57         0.75           8. Wyst. Conc         60705         2.6         1038.57         0.75           8. Wyst. Conc         60705         2.6         1038.57         0.75           Vst. Vol         60705         2.6         1038.57         0.75           Vst. Conc         60705         2.6         89.29         0.75           St. Vol         42088         2.6         1038.57         0.75           St. Conc         60705         2.6         89.29         0.75           Well         60705         2.6         89.29         0.75           II         60705         2.6         89.29         0.75           Ra Zwell         60705         2.6         89.29         0.75           Rell         60705         2.6         89.29         0.75           Rell  | <u> </u>  | 69.2                     | 4.1        | 0.17   | 102   | 93.79   | 6.5                   | 1.41E-01     | -    |
| t. Vol         60705         2.6         1038.57         0.75           & WNst. Conc         60705         2.6         1038.57         0.75           st. Vol         60705         2.6         1038.57         0.75           st. Conc         60705         2.6         1038.57         0.75           st. Vol         420888         2.6         1038.57         0.75           st. Vol         420888         2.6         1038.57         0.75           st. Vol         420888         2.6         1038.57         0.75           well         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         1.6           st Conc         60705         2.6         89.29         1.6           st Conc         60705         2.6         89.29         0.75           ell         60705         2.6         89.29         0.75           ell         607   |           | 69.2                     | 4.1        | 0.17   | 430   | 0.00    | 6.5                   | 7.97E-02     | 2    |
| & Wyst. Conc         60705         2.6         1038.57         0.75           Vst. Vol         60705         2.6         1038.57         1.6           st. Conc         60705         2.6         1038.57         1.6           st. Conc         60705         2.6         1038.57         0.75           st. Vol         420888         2.6         1038.57         0.75           st. Vol         420888         2.6         1038.57         0.75           st. Vol         60705         2.6         89.29         0.75           well         60705         2.6         89.29         0.75           well         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         1.6           conc         60705         2.6         89.29         1.6           st Conc         60705         2.6         89.29         1.6           st Conc         60705         2.6         89.29         1.6           st Conc         60705         2.6         89.29         0.75           sell         60705         2.6         89.29         0.75           sell         42   | L         | 69.2                     | 1.4        | 0.46   | 430   | 117.75  | 6.5                   | 6.53E-02     | က    |
| Vest. Vol         60705         2.6         1038.57         1.6           1st. Conc         60705         2.6         89.29         0.75           1st. Conc         60705         2.6         1038.57         0.75           1st. Vol         42088         2.6         1038.57         0.75           1st. Vol         42088         2.6         1038.57         0.75           1st. Conc         60705         2.6         89.29         1.6           1st. Conc         60705         2.6         89.29         1.6           1st. Conc         60705         2.6         89.29         1.6           1st. Conc         420888         2.6         89.29         0.75   | <u> </u>  | 146.67                   | 1.4        | 0.17   | 430   | 117.75  | 6.5                   | 6.30E-02     | 5    |
| st. Conc         60705         2.6         89.29         0.75           st. Vol         42088         2.6         1038.57         0.75           st. Vol         42088         2.6         1038.57         0.75           well         60705         2.6         89.29         0.75           well         60705         2.6         89.29         0.75           well         60705         2.6         89.29         1.6           II         60705         2.6         89.29         1.6           III         60705         2.6         89.29         1.6           III         60705         2.6         89.29         1.6           III         60705         2.6         89.29         1.6           A Zwell         60705         2.6         89.29         1.6           A Zwell         60705         2.6         89.29         0.75           III         60705         2.6         89   | _         | 32.438                   | 1.4        | 0:17   | 430   | 117.75  | 6.5                   | 5.80E-02     | 4    |
| st. Vol 42088 2.6 1038.57 0.75 well 60705 2.6 1038.57 0.75 well 60705 2.6 89.29 0.75 st Conc 420888 2.6 89.29 0.75 st Conc 60705 2.0 |           | 146.67                   | 1.4        | 0.17   | 102   | 93.79   | 6.5                   | 4.08E-02     | 9    |
| 8 Zwell         60705         2.6         1038.57         0.75           well         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         0.75           well         60705         2.6         89.29         0.75           II         60705         2.6         89.29         0.75           III         60705         2.6         89.29         0.75           conc         60705         2.6         89.29         1.6           St Conc         60705         2.6         89.29         1.6           II         60705         2.6         89.29         1.6           P         60705         2.6         89.29         1.6           A Zwell         60705         2.6         89.29         0.75           III         42088         2.6         89.29         0.75           III         42088         2.6         89.29         0.75           III         42088         2.6         89.29         0.75           III         60705         2.6         89.29         0.75           III         42088         2.6         89.29  | -         | 69.2                     | 1.4        | 0.17   | 430   | 238.82  | 6.5                   | 2.69E-02     | 7    |
| vell         60705         2.6         89.29         0.75           vell         60705         2.6         89.29         0.75           vell         60705         2.6         89.29         0.75           II         60705         2.6         89.29         0.75           III         60705         2.6         89.29         0.75           cell         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         1.6           LP         60705         2.6         89.29         1.6           P         60705         2.6         89.29         1.6           A Zwell         60705         2.6         89.29         0.75           rit Conc         42088         2.6         89.29         0.75           rit Conc         42088         2.6         89.29         0.75           rell         60705         2.6         89.2   |           | 69.20                    | 1.4        | 0.17   | 430   | 117.75  | 1.3                   | 2.22E-02     | 13   |
| st Conc 60705 2.6 89.29 0.75   ll 60705 2.6 89.29 1.6   ll 60705 2.6 89.29 0.75   lell 60705 2.6 89.29 0.75   st Conc 60705 2.6 89.29 0.75   st Conc 60705 2.6 89.29 1.6   li 60705 2.6 89.29 1.6   li 60705 2.6 89.29 1.6   li 60705 2.6 89.29 0.75   lell 60705 2.6 89.29 0.75   lell 60705 2.6 89.29 0.75   lell 420888 2.6 89.29 0.75  |           | 69.20                    | 1.4        | 0.17   | 102   | 0.00    | 6.5                   | 2.17E-02     | 8    |
| well         60705         2.6         89.29         1.6           III         60705         2.6         89.29         0.75           rell         60705         2.6         89.29         0.75           . Conc         60705         2.6         89.29         0.75           st Conc         60705         2.6         89.29         1.6           1.I.P         60705         2.6         89.29         1.6           1.I.P         60705         2.6         89.29         1.6           2.Mall         60705         2.6         89.29         0.75           3.Mall         60705         2.6         89.29         0.75           4.Conc         420888         2.6         89.29         0.75           1. Conc         420888         2.6         89.29         0.75           1. Go705         2. G         89.29         0.75           1. G         60705         2. G         89.29 <td>_</td> <td>146.67</td> <td>1.4</td> <td>0.17</td> <td>430</td> <td>0.00</td> <td>6.5</td> <td>2.16E-02</td> <td>6</td>  | _         | 146.67                   | 1.4        | 0.17   | 430   | 0.00    | 6.5                   | 2.16E-02     | 6    |
| lell 60705 2.6 89.29 0.75   conc 60705 2.6 89.29 0.75   conc 60705 2.6 89.29 0.75   st Conc 60705 2.6 89.29 1.6   cut Conc 60705 2.6 89.29 1.6   lil 60705 2.6 89.29 1.6   lil 60705 2.6 89.29 1.6   lil 60705 2.6 89.29 0.75   lil 60705 2.6 89.29 1.6   lil 60705 2.6 89.29 0.75   lil 60705 2.6  |           | 32.44                    | 1.4        | 0.17   | 102   | 93.79   | 6.5                   | 2.02E-02     | 9    |
| Fell 60705 2.6 89.29 0.75 St Conc 60705 2.6 89.29 0.75 St Conc 60705 2.6 89.29 0.75 St Conc 60705 2.6 89.29 1.6 St Conc 60705 2.6 89.29 1.6 St Conc 60705 2.6 89.29 1.6 St Conc 420888 2.6 89.29 0.75 St Conc 420888 2.6 89.29 0.75 St Conc 60705 2.6 89.29 0.75 St Conc 420888 2.6 89.29 0.75 St Conc 60705 2.6 89.29 0.75 St Conc 60705 2.6 89.29 0.75 St Conc 60705 2.6 89.29 1.6 St Conc 60705 2.6 St  | $\dashv$  | 69.20                    | 1.4        | 0.46   | 102   | 93.79   | 6.5                   | 1.91E-02     | 17   |
| Conc         60705         2 6         89.29         0.75           st Conc         60705         2 6         89.29         1.6           1.P         60705         2 6         89.29         1.6           il         60705         2 6         89.29         1.6           P         60705         2 6         89.29         0.75           R Zwell         60705         2 6         89.29         0.75           rell         60705         2 6         89.29         0.75           rt. Conc         420888         2 6         89.29         0.75           rell         60705         2 6         89.29         0.75           rell         60705         2 6         89.29         0.75           rell         420888         2 6         89.29         0.75           rell         420888         2 6         89.29         0.75           rell         420888         2 6         89.29         0.75   | 0.75      | 69.20                    | 1.4        | 0.17   | 102   | 93.79   | 1.3                   | 1.86E-02     | 12   |
| st Conc 60705 2.6 89.29 1.6 1.1   II   |           | 146.67                   | 1.4        | 0.46   | 430   | 117.75  | 6.5                   | 1.39E-02     | 14   |
| LIP 60705 2.6 89.29 1.6 60705 2.6 89.29 0.75    R Zwell 60705 2.6 89.29 0.75    R Zwell 60705 2.6 89.29 0.75    rt. Conc 420868 2.6 89.29 0.75    lt. Conc 420868 2.6 89.29 0.75    lt. Conc 420888 2.6 89.29 0.75    lt. Conc 420888 2.6 89.29 0.75    lt. Conc 60705 2.6 89.29 0.75    lt. Conc 60705 2.6 89.29 0.75    lt. Conc 60705 2.6 89.29 1.6    lt.  |           | 68.75                    | 1.4        | 0.17   | 430   | 117.75  | 6.5                   | 1.25E-02     | 15   |
| 60705 2.6 89.29 0.75     8 Zwell 60705 2.6 89.29 1.6     8 Zwell 60705 2.6 89.29 0.75     10   |           | 32.44                    | 1.4 0      | 0.17   | 430   | 0.00    | 6.5                   | 1.06E-02     | 16   |
| & Zwell         60705         2.6         89.29         1.6           & Zwell         60705         2.6         89.29         0.75           rell         60705         2.6         89.29         0.75           rt. Conc         420888         2.6         89.29         0.75           ell         420888         2.6         89.29         0.75           rell         60705         2.6         89.29         1.6           ell         420888         2.6         89.29         0.75           rell         420888         2.6         89.29         0.75  | -         | 69.20                    | 1.4 0      | 0.46   | 430   | 0.00    | 6.5                   | 9.23E-03     | 17   |
| & Zwell         60705         2.6         89.29         0.75           rell         60705         2.6         89.29         0.75           st. Conc         420888         2.6         89.29         0.75           ell         420888         2.6         89.29         0.75           rell         60705         2.6         89.29         1.6           ell         420888         2.6         89.29         0.75           P         420888         2.6         89.29         1.6  | -         | 32.44                    | 1.4        | 0.46   | 430   | 117.75  | 6.5                   | 6.62E-03     | 18   |
| tt Conc 420868 2.6 89.29 0.75   1. Conc 420868 2.6 89.29 0.75   1. Conc 60705 2.6 89.29 0.75   1. Conc 60705 2.6 89.29 1.6   1 | 0.75      | 146.67                   | 1.4 0      | 0.17   | 430   | 117.75  | 1.3                   | 6.06E-03     | 19   |
| it. Conc. 420888 2.6 89.29 0.75 sell 420888 2.6 89.29 0.75 sell 60705 2.6 89.29 0.75 sell 420888 2.6 89.29 1.6   | 0.75      | 69.20                    | 1.4 0      | 0.17   | 430   | 0.00    | 1.3                   | 5.20E-03     | 20   |
| ell 420888 2.6 89.29 0.75   1  | 0.75      | 146.67                   | 1.4 0      | 0.17   | 430   | 238.82  | 6.5                   | 4.98E-03     | 21   |
| l 60705 2.6 89.29 0.75 rell 60705 2.6 89.29 1.6 ell 420888 2.6 89.29 0.75 P 420888 2.6 89.29 1.6   |           | 69.20                    | 1.4        | 0.17   | 102   | 217.62  | 6.5                   | 4.20E-03     | 22   |
| rell 60705 2.6 89.29 <b>1.6</b> ell <b>420888</b> 2.6 89.29 0.75   -P <b>420888</b> 2.6 89.29 <b>1.6</b>   |           | 69.20                    | 1.4        | 0.46   | 430   | 117.75  | 1.3                   | 3.13E-03     | 23   |
| ell <b>420888</b> 2.6 89.29 0.75<br>-P <b>420888</b> 2.6 89.29 <b>1.6</b>  |           | 32.44                    | 1.4        | 0.17   | 430   | 117.75  | 1.3                   | 2.98E-03     | 24   |
| -P <b>420888</b> 2.6 89.29 <b>1.6</b>  | 0.75 51.9 | 69.20                    | 1.4 0.     | 0.17   | 430   | 0.00    | 6.5                   | 2.45E-03     | 25   |
|  | 1.6 51.9  | 32.44                    | 1.4 0.     | 0.17   | 430   | 238.82  | 6.5                   | 2.37E-03     | 56   |
| <b>420888</b> 2.6 89.29 0.75   | _         | 69.20                    | 1.4 0.     | 0.46   | 430   | 238.82  | 6.5                   | 1.88E-03     | 27   |
| Area & Zwell 420888 2:6 89.29 0.75   | 0.75 51.9 | 69.20                    | 1.4 0.     | 0.17   | 430   | 238.82  | 6.5                   | 1.44E-03     | 28   |

Table A.30 Sensitivity Analysis for Unleaded Gasoline tank sediment Off-site Municipal Landfill Scenario/TC Capped Benzene (20 Year Active Life)

| ATOR         (FM2)   | Two Parameters       | ۷.02   | 4,00 | 14/4     | C      |          |           |           |       |        |         |        | 1998         |       |
|--|----------------------|--------|------|----------|--------|----------|-----------|-----------|-------|--------|---------|--------|--------------|-------|
| Mail   | ino i arailleters    | Alea   | nebu | MSE. VOI |        | Wst Conc | <u>;;</u> | Wst. Den  | Infil | X-well | Y- Well | Z-Well | 9-year Avg.  |       |
| ti Vol 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 6.5 5.7Te-03 11. Vol 60705 2.6 1038.67 0.5 51.9 103.8 1.4 0.17 430 0.00 6.5 6.52E-02 1.00 60705 2.6 1038.67 0.5 51.9 103.8 1.4 0.17 430 0.00 6.5 6.52E-02 1.00 60705 2.6 1038.67 0.5 51.9 103.8 1.4 0.17 430 117.75 6.5 6.5 6.52E-02 1.00 60705 2.6 1038.67 0.5 51.9 103.8 1.4 0.17 430 117.75 6.5 6.5 6.52E-02 1.00 60705 2.6 89.29 0.5 110 220.00 1.4 0.17 430 117.75 6.5 7.9E-02 1.00 60705 2.6 89.29 0.5 51.9 103.8 1.4 0.17 430 238.82 6.5 2.63E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 238.82 6.5 2.63E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 238.82 6.5 2.08E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 238.82 6.5 2.08E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 6.5 1.30E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 6.5 1.30E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 6.5 1.30E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 6.5 1.30E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 6.5 1.30E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 6.5 1.30E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 6.5 1.30E-02 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 5.12E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 5.12E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 5.12E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 5.12E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 3.11E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 3.11E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 3.11E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 3.11E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 117.75 1.3 3.11E-03 1.00 60705 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 13.80 1.4 0.17 430 13.80 1.4 0.17 430 13.80 1.4 0.17 430 13.80 1.4 0.17 430 13.80 1.4 0.17 430 13.80 1.4 0.17 430 13.80 1.4 0.17 430 13.80 1.4 0.17 430 13.80 1.4 0.11 | at High End          | (m2)   | (E)  |          | (mg/L) | (mg/kg)  | (L/kg)    |           |       | Ξ      | Œ       | Ê      | Conc. (ma/L) | Rank  |
| 11 Vol         60705         2.6         1038.57         0.5         51.9         103.8         1.4         0.17         400         6.5         6.11.0         1.1         0.1         400         6.5         6.5E-0.1         1.1         0.1         400         6.5         6.5E-0.2         1.1         0.0         6.5         6.5E-0.2         1.1         0.0         6.5         6.5E-0.2         1.1         0.0         6.5         6.5         6.5E-0.2         1.1         0.0         6.5         6.5         6.5E-0.2         1.1         0.0         6.5<   | Base Case            | 60705  | 2.6  | 89.29    | 0.5    | 51.9     | 103.80    | 1.4       | 0.17  | 430    | 117.75  | 6.5    | 5 77E-03     |       |
| Lyol         60705         2.6         1038.67         0.5         51.9         103.8         1.4         0.17         430         0.00         6.5         6.5EE-02           Vol         60705         2.6         1038.67         0.5         51.9         103.8         1.4         0.46         430         11775         6.5         5.78E-02           Wst. Conc         60705         2.6         1038.67         0.5         110         220.00         1.4         0.17         430         11775         6.5         5.78E-02           L. Conc         60705         2.6         89.29         0.5         51.9         103.8         1.4         0.17         430         430         6.5         5.78E-02           L. Vol         420888         2.6         103.8         1.4         0.17         430         6.5         2.18E-02           HII         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.08E-02           L. Vol         42088         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5  | Xwell & Wst Vol      | 60705  |      | 1038.57  | 0.5    | 51.9     | 103.8     | 1.4       | 0.17  | 102    | 93 79   | 2 6    | 1 14E-01     | _ -   |
| Vol         60705         2.6         1038.57         0.5         51.9         103.8         1.4         0.46         430         17.75         6.5         5.79E-02           Wast Conc         60705         2.6         1038.57         0.5         110         220.00         1.4         0.17         430         17.75         6.5         5.79E-02           L. Conc         60705         2.6         1038.57         0.5         110         220.00         1.4         0.17         430         17.75         6.5         4.79E-02           L. Vol         420888         2.6         1038.57         0.5         51.9         103.8         1.4         0.17         430         238.26         6.5         2.03E-02           II. Vol         42088         2.6         103.9         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.03E-02           II. Conc         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.08E-02           Mell         60705         2.6         89.29         0.5         51.9         103.80   | Ywell & Wst. Vol     | 60705  |      | 1038.57  | 0.5    | 51.9     | 103.8     | 1.4       | 0.17  | 430    | 000     | 2 4    | 6 52E 02     | -     |
| West Conc         60705         2.6         1038.57         0.5         110         220.00         1.4         0.17         430         117.75         6.5         4.79E-02           t. Conc         60705         2.6         89.29         0.5         110         220.00         1.4         0.17         430         238.82         6.5         3.89E-02           I. Vol         420888         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         238.82         6.5         2.63E-02           ell         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.03E-02           ill         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.03E-02           Mell         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.08E-02           Zwell         60705         2.6         89.29         0.5         51.9         103.80         1.4   | Infil & Wst. Vol     | 60705  | 2.6  | 1038.57  | 0.5    | 51.9     | 103.8     | 1.4       | 0.46  | 430    | 117 75  | 2 2    | 5.32E-02     | 7 6   |
| t. Conc         60705         2.6         89.29         0.5         110         220.00         1.4         0.17         102         93.79         6.5         3.89E-02           t. Vol         42088         2.6         1038.57         0.5         51.9         103.80         1.4         0.17         430         238.82         6.5         2.63E-02           till         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.03E-02           ticonc         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.03E-02           Mell         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.03E-02           Mell         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.03E-02           Lond         60705         2.6         89.29         0.5         51.9         103.80         1.4  | Wst. Vol & Wst. Conc |        | 2.6  | 1038.57  | 0.5    | 110      | 220.00    | 4.1       | 0.17  | 430    | 117.75  | 6.5    | 4 79E-02     | ۷ د   |
| 1. Vol   420888   2.6   1038.57   0.5   51.9   103.8   1.4   0.17   430   238.82   6.5   2.63E-02   2.63E-03   2.63E-02   2.63E-03   | Kwell & Wst. Conc    | 60705  | 2.6  | 89.29    | 0.5    | 110      | 220.00    | 1.4       | 0.17  | 102    | 93 79   | 2 2    | 3 80E-02     | ٠   ٠ |
| Conc   G0705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   102   0.00   6.5   2.13E-02   1.20coc   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   0.00   6.5   2.08E-02   1.30coc   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   0.00   6.5   1.90E-02   1.30coc   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   17.75   1.3   1.81E-02   1.30coc   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.46   430   17.75   1.3   1.81E-02   1.30coc   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   17.75   1.3   5.13E-03   1.30coc   420888   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   0.00   6.5   9.21E-03   1.3   1.30coc   420888   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   238.82   6.5   4.94E-03   1.3   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   238.82   6.5   4.94E-03   1.3   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   238.82   6.5   4.94E-03   1.3   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   238.82   6.5   3.11E-03   1.3   60705   2.6   89.29   0.5   51.9   103.80   1.4   0.16   430   238.82   6.5   2.42E-03   1.4   420888   2.6   89.29   0.5   51.9   103.80   1.4   0.46   430   238.82   6.5   2.42E-03   1.4   20.88   2.6   89.29   0.5   51.9   103.80   1.4   0.46   430   238.82   6.5   3.42E-03   2.42E-03   2.42E   | Area & Wst. Vol      | 420888 | 2.6  | 1038.57  | 0.5    | 51.9     | 103.8     | 1.4       | 0.17  | 430    | 238.82  | 65     | 2.63E-02     | t   a |
| t Conc         60705         2.6         89.29         0.5         110         220.00         1.4         0.17         430         0.00         6.5         2.08E-02           III         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         6.5         1.90E-02           Zwell         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         117.75         1.3         1.81E-02           Zwell         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         117.75         1.3         1.81E-02           Conc         60705         2.6         89.29         0.5         110         220.00         1.4         0.17         430         17.75         1.3         5.12E-03           Zwell         60705         2.6         89.29         0.5         110         220.00         1.4         0.17         430         1.75         1.3         5.13E-03           III         60705         2.6         89.29         0.5         51.9         10.3         1.4         0.17  | /well & Xwell        | 60705  | 2.6  | 89.29    | 0.5    | 51.9     | 103.80    | 1.4       | 0.17  | 102    | 0.00    | 6.5    | 2 13E-02     | 7     |
| 60705   2.6   89.29   0.5   51.9   103.80   1.4   0.46   102   93.79   6.5   1.90E-02   1.80E-02   1.80E-03    | well & Wst Conc      | 60705  | 2.6  | 89.29    | 0.5    | $\vdash$ | 220.00    | 4.1       | 0.17  | 430    | 0.00    | 6.5    | 2.08E-02     | -   œ |
| 60705   2.6   89.29   0.5   51.9   103.80   1.4   0.17   102   93.79   1.3   1.83E-02   1.85E-02   1.93E-02   1.93E-03    | ıfil & Xweil         | 60705  | 2.6  | 89.29    | 0.5    |          | 103.80    | 1.4       | 0.46  | 102    | 93.79   | 6.5    | 1.90E-02     | 6     |
| Zwell         60705         2.6         1038.57         0.5         51.9         103.80         1.4         0.17         430         117.75         1.3         1.81E-02           Conc         60705         2.6         89.29         0.5         110         220.00         1.4         0.46         430         117.75         1.3         1.81E-02           Conc         60705         2.6         89.29         0.5         110         220.00         1.4         0.46         430         0.00         6.5         9.21E-03           Zwell         60705         2.6         89.29         0.5         110         220.00         1.4         0.17         430         0.00         6.5         9.21E-03           III         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         1.3         5.13E-03           I         420888         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         4.94E-03           I         420888         2.6         89.29         0.5         51.9         103.80         1.4 <t< td=""><td>well &amp; Zwell</td><td>60705</td><td>2.6</td><td>89.29</td><td>0.5</td><td></td><td>103.80</td><td>1.4</td><td>0.17</td><td>102</td><td>93.79</td><td>1.3</td><td>1 83E-02</td><td>, 0</td></t<>  | well & Zwell         | 60705  | 2.6  | 89.29    | 0.5    |          | 103.80    | 1.4       | 0.17  | 102    | 93.79   | 1.3    | 1 83E-02     | , 0   |
| Conc         60705         2.6         89.29         0.5         110         220.00         1.4         0.46         430         17.75         6.5         1.37E-02           Achell         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         0.00         6.5         1.37E-02           Achell         60705         2.6         89.29         0.5         110         220.00         1.4         0.17         430         0.00         6.5         9.21E-03           III         60705         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         4.94E-03           II         42088         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         238.82         6.5         4.94E-03           II         42088         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         20.0         6.5         4.94E-03           II         42088         2.6         89.29         0.5         51.9         103.80         1.4   | Vst. Vol & Zwell     | 60705  | 2.6  | 1038.57  | 0.5    | 1        | 103.80    | 1.4       | 0.17  | 430    | 117.75  |        | 1 81E-02     | 5 2   |
| Zwell         60705         2.6         89.29         0.5         51.9         103.80         1.4 <b>0.46</b> 430 <b>0.00</b> 6.5         9.21E-03           Zwell         60705         2.6         89.29         0.5 <b>110 220.00</b> 1.4         0.17         430 <b>0.00</b> 6.5         9.21E-03           Conc <b>42088</b> 2.6         89.29         0.5 <b>110 220.00</b> 1.4         0.17         430 <b>0.00</b> 1.3         5.13E-03           Conc <b>42088</b> 2.6         89.29         0.5 <b>110 220.00</b> 1.4         0.17         430 <b>0.00</b> 1.3         5.13E-03           I <b>42088</b> 2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         4.15E-03           I <b>42088</b> 2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.42E-03           I <b>42088</b> 2.6         89.29         0.5         51.9         103.80         <  | ifil & Wst. Conc     | 60705  | 2.6  | 89.29    | 0.5    |          | 220.00    | 1.4       | 0.46  | 430    | 117 75  | S. A.  | 1 375 00     | - 5   |
| Swell 60705 2.6 89.29 0.5 110 220.00 1.4 0.17 430 117.75 1.3 5.82E-03   1.5 conc 420888 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 238.82 6.5 4.94E-03   1.4 420888 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 217.62 6.5 4.15E-03   1.4 420888 2.6 89.29 0.5 51.9 103.80 1.4 0.46 430 238.82 6.5 2.42E-03   1.86E-03   1.   | well & Infil         | 60705  | 2.6  | 89.29    | 0.5    | T        | 103.80    | 4.1       | 0.46  | 430    | 000     | 2 2    | 0.21E-02     | 3 5   |
| Conc   42088   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   0.00   1.3   5.13E-03   Conc   42088   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   238.82   6.5   4.94E-03   Conc   42088   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   217.62   6.5   4.15E-03   Conc   42088   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   0.00   6.5   2.42E-03   Conc   42088   2.6   89.29   0.5   51.9   103.80   1.4   0.46   430   238.82   6.5   1.86E-03   Conc   42088   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   238.82   6.5   1.86E-03   Conc   42088   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   238.82   4.3   1.43E-03   Conc   42088   2.6   89.29   0.5   51.9   103.80   1.4   0.17   430   238.82   4.3   1.43E-03   Conc   42088   2.6   2.42E-03   Conc   42088   2.6   2.42E-03   Conc   42088   2.6   2.42E-03   Conc   2.8   2   | Zwell                | 60705  | 2.6  | 89.29    | 0.5    | †        | 220.00    | 1.4       | 0.17  | 430    | 117 75  | 7      | 5.21E-03     | 2 5   |
| Conc         420888         2.6         89.29         0.5         110         220.00         1.4         0.17         430         238.82         6.5         4.94E-03           I         420888         2.6         89.29         0.5         51.9         103.80         1.4         0.17         40         217.62         6.5         4.94E-03           I         420888         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.42E-03           420888         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         238.82         6.5         1.86E-03           420888         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         238.82         6.5         1.86E-03           420888         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         238.82         6.5         1.86E-03   | well & Zwell         | 60709  | 2.6  | 89.29    | 0.5    | T        | 103.80    | 4.1       | 0.17  | 430    | 000     | 2 6    | 5.02E-03     | ± 4   |
| 420888         2.6         89.29         0.5         51.9         103.80         1.4         0.17         102         217.62         6.5         4.15E-03           60705         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         117.75         1.3         3.11E-03           420888         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         238.82         6.5         1.86E-03           420888         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         238.82         6.5         1.86E-03           420888         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         238.82         6.5         1.86E-03   |                      | 420888 | 2.6  | 89.29    | 0.5    | T        | 220.00    | 十         | 0.17  | +-     | 238.82  | 2 8    | 4 94E 03     | 5 6   |
| 420888 2.6 89.29 0.5 51.9 103.80 1.4 0.46 430 117.75 1.3 3.11E-03   420888 2.6 89.29 0.5 51.9 103.80 1.4 0.46 430 238.82 6.5 1.86E-03   420888 2.6 89.29 0.5 51.9 103.80 1.4 0.46 430 238.82 6.5 1.86E-03  |                      | 420888 | 2.6  | 89.29    | 0.5    | T        | 103.80    | +         | 0.17  | +      | 217.62  | 2 6    | 4 15E-03     | 5 5   |
| 420888         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         0.00         6.5         2.42E-03           42088         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         238.82         6.5         1.86E-03           42088         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         238.82         4.3         1.43E-03  |                      | 60705  | 2.6  | 89.29    | 0.5    | T        | 103.80    | +-        | 0.46  | +      | 117 75  | 2 6    | 3.11E-03     | - 0   |
| 420888         2.6         89.29         0.5         51.9         103.80         1.4         0.46         430         238.82         6.5         1.86E-03           420888         2.6         89.29         0.5         51.9         103.80         1.4         0.17         430         238.82         1.3         1.43E-03  |                      | 420888 | 2.6  | 89.29    | 0.5    | +        | 103.80    | +         | 0.17  | +      | 0.00    | 6.5    | 2 42F-03     | 9 0   |
| 420888 2.6 89.29 0.5 51.9 103.80 1.4 0.17 430 238.82 1.3 1.42E_03  |                      | 420888 | 2.6  | 89.29    | 0.5    | $\vdash$ | 03.80     | $\dagger$ | 0.46  | _      | 238.82  | 6.5    | 1 86F-03     | 2 8   |
|  |                      | 420888 | 2.6  | -        | 0.5    | $\vdash$ | 03.80     | $\dagger$ | 0.17  | 1      | 238.82  | 13     | 1 43E-03     | 3 5   |

Table A.31 Sensitivity Analysis for HF Alkylation Off-Site Landfill/Benzene -- Industrial Areas -- 20 Year Active Life

|                      |        |       |                |        |          |         |          |       |        |                      |        | 1997         |      | 1998         |      |
|----------------------|--------|-------|----------------|--------|----------|---------|----------|-------|--------|----------------------|--------|--------------|------|--------------|------|
| Two Parameters       | Area   | Depth | Depth Wst. Vol | TCLP   | Wst Conc | Cw / Ci | Wst. Den | Infil | X-well | X-well Y- Well Z-Wel | Z-Well | 9-year Avg.  |      | 9-vear Avg.  |      |
| at High End          | (m2)   | Ξ     | (m3)           | (mg/L) | (mg/kg)  | (L/kg)  | (g/cm3)  |       |        | Œ                    | Œ      | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case            | 20200  | 2.6   | 24542.4        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 430    | 85.91                | 6.5    | 6.42E-04     |      | 4.00E-03     |      |
| Infil & Xwell        | 20200  | 2.6   | 24542.4        | 9/0.0  | 4.3      | 56.58   | 1.18     | 0.46  | 102    | 60.76                | 6.5    | 4.22E-03     | =    | 3.73E-02     | -    |
| Area & Xwell         | 162000 | 2.6   | 24542.4        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 102    | 142.35               | 6.5    | 2.30E-02     | 2    | 3.70E-02     | 2    |
| Area & TCLP          | 162000 | 5.6   | 24542.4        | 0.18   | 4.3      | 23.89   | 1.18     | 0.17  | 430    | 165.01               | 6.5    | 3.64E-02     | 2    | 3.34E-02     | က    |
| TCLP & xwell         | 20200  | 2.6   | 24542.4        | 0.18   | 4.3      | 23.89   | 1.18     | 0.17  | 102    | 92.09                | 6.5    | 2.84E-03     | 15   | 3.06E-02     | 4    |
| Area & Infil         | 162000 | 2.6   | 24542.4        | 920.0  | 4.3      | 56.58   | 1.18     | 0.46  | 430    | 165.01               | 6.5    | 3.98E-02     | -    | 2.87E-02     | 5    |
| Ywell & TCLP         | 20200  | 2.6   | 24542.4        | 0.18   | 4.3      | 23.89   | 1.18     | 0.17  | 430    | 0.00                 | 6.5    | 6.82E-04     | 24   | 2.55E-02     | 9    |
| Ywell & Infil        | 20200  | 2.6   | 24542.4        | 0.076  | 4.3      | 56.58   | 1.18     | 0.46  | 430    | 0.00                 | 6.5    | 1.27E-03     | 23   | 2.23E-02     | 7    |
| Area & Ywell         | 162000 | 2.6   | 24542.4        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 430    | 0.00                 | 6.5    | 2.26E-02     | 9    | 2.18E-02     | 8    |
| Infil & TCLP         | 20200  | 2.6   | 24542.4        | 0.18   | 4.3      | 23.89   | 1.18     | 0.46  | 430    | 85.91                | 6.5    | 6.81E-03     | 80   | 2.17E-02     | 6    |
| Area & Wst. Conc     | 162000 | 2.6   | 24542.4        | 0.076  | 14       | 184.21  | 1.18     | 0.17  | 430    | 165.01               | 6.5    | 3.02E-02     | 3    | 2.07E-02     | 9    |
| Ywell & Xwell        | 20200  | 2.6   | 24542.4        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 102    | 0.00                 | 6.5    | 2.79E-04     | 27   | 1.95E-02     | =    |
| Area & Wst. Vol      | 162000 | 2.6   | 38247.5        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 430    | 165.01               | 6.5    | 2.43E-02     | 4    | 1.92E-02     | 12   |
| Xwell & Zwell        | 20200  | 2.6   | 24542.4        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 102    | 92.09                | 1.3    | 1.42E-03     | 22   | 1.63E-02     | 13   |
| Xwell & Wst Vol      | 20200  | 2.6   | 38247.5        | 0.076  | 4.3      | 56.58   | 1:18     | 0.17  | 102    | 92'09                | 6.5    | 1.48E-03     | 20   | 1.37E-02     | 14   |
| Xwell & Wst. Conc    | 20200  | 2.6   | 24542.4        | 0.076  | 14       | 184.21  | 1.18     | 0.17  | 102    | 92.09                | 6.5    | 1.45E-03     | 21   | 1.36E-02     | 15   |
| Ywell & Wst. Vol     | 20200  | 2.6   | 38247.5        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 430    | 0.00                 | 6.5    | 6.11E-04     | 56   | 1.15E-02     | 16   |
| Ywell & Wst Conc     | 20200  | 2.6   | 24542.4        | 0.076  | 14       | 184.21  | 1.18     | 0.17  | 430    | 00.0                 | 6:5    | 6.74E-04     | 55   | 1.14E-02     | 17   |
| Infil & Wst. Conc    | 20200  | 2.6   | 24542.4        | 0.076  | 14       | 184.21  | 1.18     | 0.46  | 430    | 85.91                | 6.5    | 6.35E-03     | 6    | 1.03E-02     | 18   |
| Infil & Wst. Vol     | 20200  | 2.6   | 38247.5        | 0.076  | 4.3      | 56.58   | 1.18     | 0.46  | 430    | 85.91                | 6.5    | 4.31E-03     | 5    | 1.02E-02     | 19   |
| TCLP & Wst Conc      | 20200  | 2.6   | 24542.4        | 0.18   | 14       | 87.77   | 1.18     | 0.17  | 430    | 85.91                | 6.5    | 3.18E-03     | 13   | 9.33E-03     | 20   |
| Area & Zwell         | 162000 | 2.6   | 24542.4        | 9/0.0  | 4.3      | 56.58   | 1.18     | 0.17  | 430    | 165.01               | 6.5    | 8.69E-03     | 7    | 9.24E-03     | 21   |
| TCLP & Wst. Vol      | 20200  | 2.6   | 38247.5        | 0.18   | 4.3      | 23.89   | 1.18     | 0.17  | 430    | 85.91                | 6.5    | 2.90E-03     | 14   | 9.23E-03     | 22   |
| Ywell & Zwell        | 20200  | 2.6   | 24542.4        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 430    | 0.00                 | 1.3    | 2.73E-04     | 28   | 5.58E-03     | 23   |
| Infil & Zwell        | 20200  | 2.6   | 24542.4        | 0.076  | 4.3      | 56.58   | 1.18     | 0.46  | 430    | 85.91                | 1.3    | 3.88E-03     | 12   | 4.44E-03     | 24   |
| TCLP & Zwell         | 20200  | 2.6   | 24542.4        | 0.18   | 4.3      | 23.89   | 1.18     | 0.17  | 430    | 85.91                | 1.3    | 2.05E-03     | 16   | 4.26E-03     | 25   |
| Wst. Vol & Wst. Conc | 20200  | 2.6   | 38247.5        | 0.076  | 14       | 184.21  | 1.18     | 0.17  | 430    | 85.91                | 6.5    | 1.71E-03     | 18   | 3.98E-03     | 56   |
| Wst. Vol & Zwell     | 20200  | 2.6   | 38247.5        | 0.076  | 4.3      | 56.58   | 1.18     | 0.17  | 430    | 85.91                | 1.3    | 1.54E-03     | 19   | 1.92E-03     | 27   |
| Wst Conc & Zwell     | 20200  | 2.6   | 24542.4        | 0.076  | 14       | 184.21  | 1.18     | 0.17  | 430    | 85.91                | 1.3    | 1.74E-03     | 17   | 1.91E-03     | 88   |
|                      |        |       |                |        |          |         |          |       |        |                      |        |              |      |              |      |

Table A.32 Sensitivity Analysis for HF Alkylation Off-Site Landfill/Benzene -- Municipal Areas -- 20 Year Active Life

|                      |        |       |          |        |          |         |                   |       |                |                |        | 1997         |      | 1998       |      |
|----------------------|--------|-------|----------|--------|----------|---------|-------------------|-------|----------------|----------------|--------|--------------|------|------------|------|
| Two Parameters       | Area   | Depth | Wst. Vol | TCL P  | Wst Conc | Cw / Ci | Wet Den           | Infil | X-well         | X-well Y. Well | 7-Well | 9-Vear Ave   |      | 9-year Ava |      |
| at High End          | (m2)   | Ξ(Ε)  | (m3)     | (mg/L) | (mg/kg)  |         | (g/cm3)           |       |                | (E)            | (m)    | Conc. (mg/L) | Rank | _          | Rank |
| Base Case            | 90209  | 2.6   | 24542.4  | 9/0.0  | 4.3      | 56.58   | 1.18              | 0.17  | 8 <del>4</del> | 117.75         | 6.5    | 6.42E-04     |      | 9.65E-03   |      |
| TCLP & xwell         | 60705  | 5.6   | 24542.4  | 0.18   | 4.3      | 23.89   | 1.18              | 0.17  | 102            | 93.79          | 6.5    | 2.84E-03     | 15   | 6.06E-02   | -    |
| Infil & Xwell        | 60705  | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.46  | 102            | 93.79          | 6.5    | 4.22E-03     | 7    | 5.18E-02   | 2    |
| Infil & TCLP         | 60705  | 5.6   | 24542.4  | 0.18   | 4.3      | 23.89   | 1.18              | 0.46  | 430            | 117.75         | 6.5    | 6.81E-03     | 80   | 4.18E-02   | 3    |
| Ywell & TCLP         | 60705  | 2.6   | 24542.4  | 0.18   | 4.3      | 23.89   | 1.18              | 0.17  | 430            | 0.00           | 6.5    | 6.82E-04     | 24   | 3.66E-02   | 4    |
| Area & Xwell         | 420888 | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 102            | 217.62         | 6.5    | 2.30E-02     | 2    | 3.41E-02   | 5    |
| Area & TCLP          | 420888 | 2.6   | 24542.4  | 0.18   | 4.3      | 23.89   | 1.18              | 0.17  | 430            | 238.82         | 6.5    | 3.64E-02     | 2    | 3.13E-02   | 9    |
| Ywell & Xwell        | 60705  | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 102            | 0.00           | 6.5    | 2.79E-04     | 27   | 3.07E-02   | 7    |
| Xwell & Wst. Conc    | 60705  | 2.6   | 24542.4  | 0.076  | 14       | 184.21  | 1.18              | 0.17  | 102            | 93.79          | 6.5    | 1.45E-03     | 21   | 2.99E-02   | 8    |
| Ywell & Infil        | 90209  | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.46  | 430            | 0.00           | 6.5    | 1.27E-03     | 23   | 2.93E-02   | 6    |
| Xwell & Wst Vol      | 60705  | 2.6   | 38247.5  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 102            | 93.79          | 6.5    | 1.48E-03     | 20   | 2.89E-02   | 9    |
| Area & Wst. Conc     | 420888 | 2.6   | 24542.4  | 0.076  | 14       | 184.21  | 1.18              | 0.17  | 430            | 238.82         | 6.5    | 3.02E-02     | 3    | 2.77E-02   | =    |
| Xwell & Zwell        | 60705  | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 102            | 93.79          | 1.3    | 1.42E-03     | 22   | 2.57E-02   | 12   |
| Infil & Wst. Conc    | 60705  | 2.6   | 24542.4  | 0.076  | 14       | 184.21  | 1.18              | 0.46  | 430            | 117.75         | 6.5    | 6.35E-03     | 6    | 2.41E-02   | 13   |
| Area & Wst. Vol      | 420888 | 2.6   | 38247.5  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 430            | 238.82         | 6.5    | 2.43E-02     | 4    | 2.34E-02   | 4    |
| TCLP & Wst Conc      | 60705  | 2.6   | 24542.4  | 0.18   | 14       | 77.78   | s 1.18            | 0.17  | 430            | 117.75         | 6.5    | 3.18E-03     | 13   | 2.31E-02   | 15   |
| Area & Infil         | 420888 | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.46  | 430            | 238.82         | 6.5    | 3.98E-02     | -    | 2.27E-02   | 16   |
| Infil & Wst. Vol     | 60705  | 2.6   | 38247.5  | 0.076  | 4.3      | 56.58   | 1.18              | 0.46  | 430            | 117.75         | 6.5    | 4.31E-03     | 5    | 2.26E-02   | 12   |
| TCLP & Wst. Vol      | 60705  | 2.6   | 38247.5  | 0.18   | 4.3      | 23.89   | 1.18              | 0.17  | 430            | 117.75         | 6.5    | 2.90E-03     | 14   | 2.18E-02   | 18   |
| Area & Ywell         | 420888 | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 430            | 0.00           | 6.5    | 2.26E-02     | 9    | 2.10E-02   | 19   |
| Ywell & Wst Conc     | 60705  | 2.6   | 24542.4  | 0.076  | 14       | 184.21  | 1.18              | 0.17  | 430            | 0.00           | 6.5    | 6.74E-04     | 25   | 1.85E-02   | 8    |
| Ywell & Wst. Vol     | 60705  | 2.6   | 38247.5  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 430            | 0.00           | 6.5    | 6.11E-04     | 56   | 1.77E-02   | 21   |
| Area & Zwell         | 420888 | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 430            | 238.82         | 6.5    | 8.69E-03     | 7    | 1.22E-02   | 22   |
| Wst. Vol & Wst. Conc | 60705  | 2.6   | 38247.5  | 0.076  | 14       | 184.21  | 1.18              | 0.17  | 430            | 117.75         | 6.5    | 1.71E-03     | 18   | 1.04E-02   | 23   |
| TCLP & Zwell         | 60705  | 2.6   | 24542.4  | 0.18   | 4.3      | 23.89   | 1.18              | 0.17  | 430            | 117.75         | 1.3    | 2.05E-03     | 16   | 1.01E-02   | 24   |
| Infil & Zwell        | 60705  | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.46  | 430            | 117.75         | 1.3    | 3.88E-03     | 12   | 9.93E-03   | 25   |
| Ywell & Zwell        | 60705  | 2.6   | 24542.4  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 430            | 0.00           | 1.3    | 2.73E-04     | 78   | 8.45E-03   | 56   |
| Wst Conc & Zwell     | 60705  | 2.6   | 24542.4  | 0.076  | 14       | 184.21  | <sub>4</sub> 1.18 | 0.17  | 430            | 117.75         | 1.3    | 1.74E-03     | 17   | 5.11E-03   | 27   |
| Wst. Vol & Zwell     | 60705  | 2.6   | 38247.5  | 0.076  | 4.3      | 56.58   | 1.18              | 0.17  | 430            | 117.75         | 1.3    | 1.54E-03     | 19   | 4.89E-03   | 78   |

Table A.33 Sensitivity Analysis CSO Off-site Landfill Scenario, Benzene -- Industrial Areas, 30 Year Active Life

| Two-Parameters         Area         Depth         West Vol.         TCLP         West Conc         Cwy Conc         West Depth         West Depth         West Vol.         Mest Population         Frage at High End         Frage at High  |                  |                   |       |               |          |           |        |           |      |        |         |         | 1007         |       | 0007         |      |
|--|------------------|-------------------|-------|---------------|----------|-----------|--------|-----------|------|--------|---------|---------|--------------|-------|--------------|------|
| Fig.   (m2)   (m3)   (m3/L)   (m9/L)   (m9/L)   (m1/L)    Two-Parameters   | Area              | Depth | Wst. Vol      |          | Wst Conc  | CW/C   | Wst. Den  |      | X-well | Y. Wall | 7.Wo.18 |              |       | 9861         |      |
| Vol   20200   2.6   3963.57   0.059   1.2   20.34   1.4   0.17   430   85.91   6.5   | at High End      | (m <sub>2</sub> ) | (E)   | (m3)          | ( I/ww/  | (ma/ha)   | 1 1/2  | (0,000)   | _    | ,      | 11244   | 112AA-7 |              |       | 9-year Avg.  |      |
| Vol   1,000   2.6   3953.57   0.059   1.2   20.34   1.4   0.17   430   85.91   6.5   4.78E.04   1.2   20.200   2.6   3953.57   0.059   1.2   20.34   1.4   0.46   102   6.076   6.5   3.07E.03   1.2   20.34   1.4   0.17   430   185.01   6.5   3.07E.03   1.5   20.34   1.4   0.17   430   185.01   6.5   3.23E.03   1.5   20.34   1.4   0.17   430   6.076   6.5   3.23E.03   1.5   20.34   1.4   0.17   102   6.076   6.5   3.23E.03   1.5   20.34   1.4   0.17   102   6.076   6.5   1.08E.03   1.5   2.034   1.4   0.17   430   6.0   6.5   2.16E.03   1.5   2.034   1.4   0.17   430   6.5   2.16E.03   1.5   2.034   1.4   0.17   430   6.5   2.34E.03   1.5   2.34E.03   1.5   2.030   1.5   2.034   1.4   0.17   430   8.5   1.6   6.5   1.34E.03   1.5   2.030   1.5   2.034   1.4   0.17   430   8.5   1.5   6.5   1.34E.03   1.5   2.030   1.5   2.034   1.4   0.17   430   8.5   1.5   6.5   3.24E.03   1.5   2.030   1.5   2.034   1.4   0.17   430   8.5   1.5   2.04E.04   1.5   2.030   2.6   3.5357   0.059   1.2   2.034   1.4   0.17   430   8.5   1.3   3.54E.03   1.5   2.030   1.5   2.034   1.4   0.17   430   8.5   1.3   3.54E.03   1.5   2.030   2.6   3.5357   0.059   1.2   2.034   1.4   0.17   430   8.5   1.3   3.54E.03   1.5   2.030   1.5   2.034   1.4   0.17   430   8.5   1.3   3.54E.03   1.5   2.030   1.5   2.034   1.4   0.17   430   8.5   1.3   3.54E.03   1.5   2.034   1.4   0.17   430   8.5   1.3   3.54E.04   1.5   2.030   2.6   3.5357   0.059   1.2   2.034   1.4   0.17   430   8.5   1.3   3.54E.04   1.5   2.030   2.6   3.53537   0.059   1.2   2.034   1.4   0.17   430   8.5   1.3   3.54E.04   1.5   2.030   2.6   3.53537   0.059   1.5   | Race Cace        | 20000             | 0     | 70500         | (1 Sec.) | - 4       | (EVVZ) | (g/cm3)   | myr. | Œ)     | (m)     | (m)     | Conc. (mg/L) | Rank  | Conc. (mg/L) | Rank |
| VOI         \$120,000         \$1.6         \$1.55.0.05         \$1.2         \$20.34         \$1.4         \$0.46         \$10.7         \$6.7         \$6.5         \$3.07E-03           VOI         \$162000         \$2.6         \$45360         \$1.05         \$1.2         \$20.34         \$1.4         \$0.17         \$10.7 <t< td=""><td>2000 0000</td><td>20200</td><td>0.7</td><td>3833.37</td><td>0.059</td><td>1.2</td><td>20.34</td><td>1.4</td><td>0.17</td><td>430</td><td>85.91</td><td>6.5</td><td>4.78E-04</td><td></td><td>2.27E-03</td><td></td></t<>   | 2000 0000        | 20200             | 0.7   | 3833.37       | 0.059    | 1.2       | 20.34  | 1.4       | 0.17 | 430    | 85.91   | 6.5     | 4.78E-04     |       | 2.27E-03     |      |
| Vol  | IIIIII & AWell   | 20200             |       | 3953.57       | 0.059    | 1.2       | 20.34  | 1.4       | 0.46 | 102    | 60.76   | 6.5     | 3.07E-03     | 7     | 1 82F-02     | 1    |
| Noise   20200   2.6   3963.67   0.059   1.2   20.34   1.4   0.17   102   60.76   6.5   1.08E-0.3   1.08E-0.3   1.2   20.34   1.4   0.17   102   60.76   6.5   1.08E-0.3   1.08E-0.3   1.2   20.20   2.6   3963.67   0.059   1.2   20.34   1.4   0.17   102   60.76   6.5   1.08E-0.3   1.08E-0.3   1.2   20200   2.6   3963.67   0.059   1.2   20.34   1.4   0.17   102   60.76   6.5   1.45E-0.3   1.53E-0.3    | Area & WSt. Vol  | 162000            |       | 67350         | 0.059    | 1.2       | 20.34  | 1.4       | 0.17 | 430    | 165.01  | 6.5     | 1.55E-02     |       | 1 47F-02     | - 6  |
| Vol         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         102         0.07         0.0         0.5         0.108-0.3           20200         2.6         3963.57         0.059         1.2         20.34         1.4         0.46         430         0.00         6.5         1.08E-03           1         20200         2.6         3963.57         0.059         1.2         20.34         1.4         0.17         402         60.76         6.5         1.45E-03           1         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         402         60.76         6.5         1.45E-03           1         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         6.0         6.5         2.16E-03           1         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         6.0         6.5         2.16E-03           1         20200         2.6         67350         0.059         1.2         20.34         1.4         0.46  | Ywell & Xwell    | 20200             | 2.6   | 3953.57       | 0.059    | 1.2       | 20.34  | 14        | 0.17 | 102    | 80      | A A     | 3 225 03     |       | 1 477 00     | 7    |
| 10200   2.6   3963.57   0.059   1.2   20.34   1.4   0.46   430   0.00   6.5   1.08E-0.3     20200   2.6   3963.57   0.059   1.2   20.34   1.4   0.46   430   0.00   6.5   4.83E-0.3     20200   2.6   3963.57   0.059   1.2   20.34   1.4   0.17   102   60.76   6.5   1.45E-0.3     20200   2.6   3963.57   0.059   1.2   20.34   1.4   0.17   430   0.00   6.5   2.16E-0.3     20200   2.6   3963.57   0.059   1.2   20.34   1.4   0.17   430   0.00   6.5   2.16E-0.3     20200   2.6   3963.57   0.059   1.2   20.34   1.4   0.17   430   0.00   6.5   2.16E-0.3     20200   2.6   3963.57   0.059   1.2   20.34   1.4   0.17   430   85.91   6.5   1.34E-0.3     20200   2.6   3963.57   0.064   1.2   14.29   1.4   0.17   430   85.91   6.5   1.4E-0.3     20200   2.6   3963.57   0.064   1.2   20.34   1.4   0.17   430   85.91   6.5   3.24E-0.3     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   3.24E-0.3     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   3.24E-0.3     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   3.26E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   3.26E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   3.20E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   3.20E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   3.20E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   3.20E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   2.20E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   2.20E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   2.20E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   2.20E-0.4     20200   2.6   3963.57   0.069   1.2   20.34   1.4   0.17   430   6.50   1.3   2.20E-0.4     20200   2.6   396 | Xwell & Wst Vol  | 20200             | 2.6   | 67350         | 0.059    | 12        | 20 34  |           | 147  |        | 3 6     | 3 6     | 3.235-03     | n     | 1.15E-02     | e    |
| 1,000   2.02   3953.57   0.059   1.2   20.34   1.4   0.46   430   0.00   6.5   4.83E.03   1.45E.03   20200   2.6   3953.57   0.084   1.2   20.34   1.4   0.17   102   60.76   6.5   1.45E.03   1.45E | Ywell & Infil    | OUGUC             | 36    | 3052 57       | 000      | ! (       | 5 6    | •         | 3    | 102    | 00.70   | 0.0     | 1.08E-03     | 16    | 1.07E-02     | 4    |
| 1, 20200   2.6   3953.5   0.084   1.2   14.29   1.4   0.17   102   60.76   6.5   1.45E-03   1.45E | TOID & WILDIN    | 20200             | 2.0   |               | 0.038    | 7.1       | 20.34  | 4.1       | 0.46 | 430    | 0.00    | 6.5     | 4.83E-03     | 3     | 1.06E-02     | 2    |
| Vol         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         402         60.76         1.3         1.53E-03           Vol         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         6.06         6.5         2.16E-03           01         20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         6.5         6.5         5.61E-03           01         20200         2.6         3953.57         0.084         1.2         20.34         1.4         0.17         430         6.5         1.34E-03           Vol         20200         2.6         67350         0.084         1.2         20.34         1.4         0.46         430         85.91         6.5         1.34E-03           Vol         20200         2.6         67350         0.084         1.2         20.34         1.4         0.17         430         85.91         6.5         1.34E-03           Vol         20200         2.6         3953.57         0.069         1.2         20.34         1.4         0.17 <td< td=""><td>Xwell &amp; Zwell</td><td>20200</td><td>7.0</td><td></td><td>0.084</td><td>1.2</td><td>14.29</td><td>1.4</td><td>0.17</td><td>102</td><td>92.09</td><td>6.5</td><td>1.45E-03</td><td>13</td><td>1.05E-02</td><td>9</td></td<>   | Xwell & Zwell    | 20200             | 7.0   |               | 0.084    | 1.2       | 14.29  | 1.4       | 0.17 | 102    | 92.09   | 6.5     | 1.45E-03     | 13    | 1.05E-02     | 9    |
| VOI         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03           10         20200         2.6         67350         0.084         1.2         20.34         1.4         0.17         430         0.00         6.5         2.87E-03           Vol         20200         2.6         67350         0.084         1.2         20.34         1.4         0.46         430         85.91         6.5         1.34E-03           Vol         20200         2.6         67350         0.084         1.2         20.34         1.4         0.46         430         85.91         6.5         1.34E-03           Vol         20200         2.6         67350         0.084         1.2         20.34         1.4         0.17         430         85.91         6.5         1.34E-03           Vol         20200         2.6         3953.57         0.069         1.2         20.34         1.4         0.17         <  | Water of Ewell   | 20200             | 7.0   |               | 0.029    | 1.2       | 20.34  | 1.4       | 0.17 | 102    | 60.76   | 1.3     | 1.53E-03     | 12    | 9.65E-03     | -    |
| 162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         102         142.35         6.5         5.61E-03           20200         2.6         3953.57         0.084         1.2         14.29         1.4         0.17         430         0.00         6.5         5.87E-03           vol         20200         2.6         3953.57         0.084         1.2         20.34         1.4         0.46         430         85.91         6.5         1.34E-03           Vol         20200         2.6         3953.57         0.084         1.2         14.29         1.4         0.17         430         85.91         6.5         1.34E-03           Vol         20200         2.6         3953.57         0.089         1.2         20.34         1.4         0.17         430         85.91         6.5         1.34E-03           162000         2.6         3953.57         0.089         1.2         20.34         1.4         0.17         430         85.91         6.5         2.61E-03           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         86.91  | rwell & WSt. VOI | 20200             | 2.6   |               | 0.059    | 1.2       | 20.34  | 1.4       | 0.17 | 430    | 0.00    | 6.5     | 2.16E-03     | 9     | 8.93E-03     | 00   |
| Columbrid   Colu | Area & Xwell     | 162000            | 2.6   |               | 0.059    | 1.2       | 20.34  | 1.4       | 0.17 | 102    | 142.35  | 6.5     | 5.61E-03     | ,     | 8 32E-03     | 0    |
| Outloan   Colon   Co | Ywell & ICLP     | 20200             | 2.6   |               | 0.084    | 1.2       | 14.29  | 14        | 0.17 | 430    | 000     | 6.5     | 2 87E-03     | , a   | 8 20E 03     | ,    |
| Vol         20200         2.6         3953.57         0.084         1.2         14.29         1.4         0.46         430         65.91         6.5         1.34E-03           Vol         20200         2.6         67350         0.084         1.2         14.29         1.4         0.46         430         65.91         6.5         1.64E-03           162000         2.6         3953.57         0.084         1.2         20.34         1.4         0.17         430         6.5         6.5         3.24E-03           162000         2.6         3953.57         0.084         1.2         20.34         1.4         0.17         430         6.5         3.24E-03           20200         2.6         3953.57         0.089         1.2         20.34         1.4         0.17         430         6.5         3.17E-03           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         6.50         1.3         9.50E-04           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         4.84E-04           20200   | Infil & Wst. Vol | 20200             | 2.6   | 1             | 0.059    | 12        | 20 24  | **        | 97.0 | 130    | 20      |         | 2011         | 5     | 0.295-03     | 2    |
| Vol         20200         2.0         393.37         0.084         1.2         1.4         0.46         430         85.91         6.5         1.64E-03           Vol         20200         2.6         67350         0.084         1.2         1.4         0.17         430         85.91         6.5         6.99E-04           162000         2.6         3953.57         0.084         1.2         20.34         1.4         0.17         430         0.60         6.5         3.24E-03           162000         2.6         3953.57         0.084         1.2         20.34         1.4         0.17         430         165.01         6.5         3.24E-03           20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         165.01         6.5         2.61E-03           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         4.84E-04           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           w   | Infil & TC! P    | 00000             | 90    |               | 2000     | 31        | 5 3    | <u>+</u>  | 0.40 | 430    | 85.91   | 6.5     | 1.34E-03     | 4     | 7.86E-03     | 7    |
| 162000         2.6         3953.57         0.059         1.2         14.29         1.4         0.17         430         85.91         6.5         6.99E-04           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         3.24E-03           162000         2.6         3953.57         0.084         1.2         20.34         1.4         0.17         430         165.01         6.5         3.24E-03           20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         165.01         6.5         2.61E-03           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.46         430         1.3         4.84E-04           16200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         1.27E-03           well         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04 <t< td=""><td>TCI P &amp; Wet Vol</td><td>20200</td><td>200</td><td>_</td><td>0.084</td><td>1.2</td><td>14.29</td><td>1.4</td><td>0.46</td><td>430</td><td>85.91</td><td>6.5</td><td>1.64E-03</td><td>=</td><td>5.40E-03</td><td>12</td></t<>  | TCI P & Wet Vol  | 20200             | 200   | _             | 0.084    | 1.2       | 14.29  | 1.4       | 0.46 | 430    | 85.91   | 6.5     | 1.64E-03     | =     | 5.40E-03     | 12   |
| 162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         3.24E-03           162000         2.6         3953.57         0.084         1.2         14.29         1.4         0.17         430         165.01         6.5         3.77E-03           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.46         430         165.01         6.5         2.61E-03           20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.46         430         85.91         1.3         4.84E-04           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.46         430         85.91         1.3         4.84E-04           16200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           10200         2.6         3953.57         0.084         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04   | V 200 0 V        | 2000              | 0.9   | -             | 0.004    | 7.1       | 14.29  | 1.4       | 0.17 | 430    | 85.91   | 6.5     | 6.99E-04     | 18    | 4.33E-03     | 13   |
| 162000         2.6         3953.57         0.084         1.2         14.29         1.4         0.17         430         165.01         6.5         3.17E-03           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.46         430         165.01         6.5         2.61E-03           20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         4.84E-04           Mell         20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         4.84E-04           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           20200         2.6         3953.57         0.084         1.2         1.4         0.17         430         85.91         1.3         2.77E-03   |                  | 162000            | 7.6   | _             | 0.059    | 1.2       | 20.34  |           | 0.17 | 430    | 0.00    | 6.5     | 3.24E-03     | 4     | 4.32E-03     | 14   |
| 162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.46         430         165.01         6.5         2.61E-03           20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         0.00         1.3         9.50E-04           162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         4.84E-04           well         20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           20200         2.6         3953.57         0.064         1.2         14.29         1.4         0.17         430         85.91         1.3         2.08E-04   | ٩,               | 162000            | 5.6   |               | 0.084    | 1.2       | 14.29  | H         | 0.17 | ┼─     | 165.01  | 6.5     | 3.17E-03     | 9     | 3 81E-03     | ,    |
| 20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         0.00         1.3         9.50E-04           20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.46         430         85.91         1.3         4.84E-04           Nell         20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         1.2Fe-03           Nell         20200         2.6         3953.57         0.084         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           20200         2.6         3953.57         0.084         1.2         14.29         1.4         0.17         430         85.91         1.3         2.77E-04  |                  | 162000            | 2.6   | <del></del>   | 0.059    |           | 20.34  | $\dagger$ | 0.46 | +      | 165.01  | 6.5     | 2.61E-03     | 0     | 3 59E-03     | 2 4  |
| 20200         2.6         3953.57         0.059         1.2         20.34         1.4         0.46         430         85.91         1.3         4.84E-04           46200         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         4.84E-04           nell         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           20200         2.6         3953.57         0.084         1.2         14.29         1.4         0.17         430         85.91         1.3         2.77E-04  | Ywell & Zwell    | 20200             | 2.6   |               | 0.059    | $\vdash$  | 20.34  | $\dagger$ | 0.17 | +      | 0.00    | 1.3     | 9.50E-04     | , [-  | 3.18F-03     | 2 2  |
| 162000         2.6         3953.57         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         1.27E-03           well         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           20200         2.6         3953.57         0.084         1.2         14.29         1.4         0.17         430         85.91         1.3         2.77E-04   | Infil & Zwell    | 20200             | 2.6   |               | 0.059    | $\vdash$  | 20.34  | T         | 0.46 | 430    | 85.91   | 7       | 4 84E-04     | :   0 | 2045         | =    |
| well         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04           20200         2.6         3953.57 <b>0.084</b> 1.2 <b>14.29</b> 1.4         0.17         430         85.91         1.3         2.77E-04   |                  | 162000            | 2.6   | $\overline{}$ | 0.059    | T         | 20.34  | $\dagger$ | 17   | +      | 100     |         | 10.1         | 2 !   | 2.01E-03     | ٥    |
| 20200 2.6 3953.57 0.084 1.2 14.29 1.4 0.17 430 85.91 1.3 2.77E-04  | T                | 20200             | 2.8   | _             | 0 0 0    | T         |        | $\dagger$ |      | +      | 100.01  | ?       | 1.2/E-03     | 15    | 1.87E-03     | 9    |
| 2020 2.0 3933.37 0.084 1.2 14.29 1.4 0.17 430 85.91 1.3 2.77E-04   |                  | 00000             | 0 0   | -             | 0.00     | 7         | ţ,     | 1         |      |        | 85.91   | 1.3     | 2.08E-04     | 21    | 1.49E-03     | 20   |
|  |                  | 20200             | 0.7   | -1            | 0.084    | $\exists$ | 14.29  |           |      |        | 85.91   | 1.3     | 2.77E-04     | 20    | 1.39E-03     | 21   |

Table A.34 Sensitivity Analysis CSO Off-site Landfill Scenario, Benzene -- Municipal Areas, 30 year Active Life

|                  |        |       |                |        |                           |                 |          |        | Ī      |                       |          |                   |      |              | ſ    |
|------------------|--------|-------|----------------|--------|---------------------------|-----------------|----------|--------|--------|-----------------------|----------|-------------------|------|--------------|------|
|                  |        |       |                |        |                           |                 |          |        |        |                       | .•       | 1997              |      | 1998         |      |
| Two-Parameters   | Area   | Depth | Depth Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | <u>⊡</u><br>/\& | Wst. Den | IIIII  | X-well | X-well Y- Well Z-Well | Z-Well   | 9-year Avg.       |      | 9-year Avg.  |      |
| at High End      | (m2)   | (m)   | (m3)           | (mg/L) | (mg/kg)                   | (L/kg)          | (g/cm3)  | (m/yr) | Ξ      | <u>E</u>              | <b>E</b> | Conc. (mg/L) Rank | Rank | Conc. (mg/L) | Rank |
| Base Case        | 60705  | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 1.4      | 0.17   | 430    | 117.75                | 6.5      | 4.78E-04          |      | 3.74E-03     |      |
| Xwell & Wst Vol  | 60705  | 2.6   | 67350          | 0.059  | 1.2                       | 20.34           | 1.4      | 0.17   | 102    | 93.79                 | 6.5      | 1.08E-03          | 16   | 2.21E-02     | -    |
| Infil & Wst. Vol | 60705  | 2.6   | 67350          | 0.059  | 1.2                       | 20.34           | 1.4      | 0.46   | 430    | 117.75                | 6.5      | 1.34E-03          | 14   | 1.69E-02     | 2    |
| Area & Wst. Vol  | 420888 | 2.6   | 67350          | 0.059  | 1.2                       | 20.34           | 1.4      | 0.17   | 430    | 238.82                | 6.5      | 1.55E-02          | -    | 1.66E-02     | 8    |
| Infil & Xwell    | 60705  | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 1.4      | 0.46   | 102    | 93.79                 | 6.5      | 3.07E-03          | 7    | 1.52E-02     | 4    |
| TCLP & xwell     | 90209  | 2.6   | 3953.57        | 0.084  | 1.2                       | 14.29           | 1.4      | 0.17   | 102    | 93.79                 | 6.5      | 1.45E-03          | 13   | 1.39E-02     | 5    |
| Ywell & Wst. Vol | 60705  | 2.6   | 67350          | 0.059  | 1.2                       | 20.34           | 4.1      | 0.17   | 430    | 0.00                  | 6.5      | 2.16E-03          | 9    | 1.36E-02     | 9    |
| Ywell & Xwell    | 60705  | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 1.4      | 0.17   | 102    | 0.00                  | 6.5      | 3.23E-03          | 2    | 1.29E-02     | -    |
| Xwell & Zwell    | 60705  | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 4.1      | 0.17   | 102    | 93.79                 | 1.3      | 1.53E-03          | 12   | 1.09E-02     | 80   |
| TCLP & Wst. Vol  | 60705  | 2.6   |                | 0.084  | 1.2                       | 14.29           | 1.4      | 0.17   | 430    | 117.75                | 6.5      | 6.99E-04          | 18   | 1.05E-02     | 6    |
| Ywell & TCLP     | 60705  | 2.6   | 3953.57        | 0.084  | 1.2                       | 14.29           | 1.4      | 0.17   | 430    | 0.00                  | 6.5      | 2.87E-03          | 80   | 7.74E-03     | 10   |
| Ywell & Infil    | 60705  | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 4.1      | 0.46   | 430    | 0.00                  | 6.5      | 4.83E-03          | 3    | 7.45E-03     | =    |
| Infil & TCLP     | 60705  | 2.6   | 3953.57        | 0.084  | 1.2                       | 14.29           | 14       | 0.46   | 430    | 117.75                | 6.5      | 1.64E-03          | Ξ    | 5.73E-03     | 12   |
| Wst. Vol & Zwell | 60705  | 2.6   | 67350          | 0.059  | 1.2                       | 20.34           | 1.4      | 0.17   | 430    | 117.75                | 1.3      | 2.08E-04          | 21   | 3.75E-03     | 13   |
| Area & Xwell     | 420888 | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 1.4      | 0.17   | 102    | 217.62                | 6.5      | 5.61E-03          | 2    | 3.58E-03     | 14   |
| Ywell & Zwell    | 90209  | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 4.1      | 0.17   | 430    | 0.00                  | 1.3      | 9.50E-04          | 17   | 3.30E-03     | 15   |
| Infil & Zwell    | 90209  | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 1.4      | 0.46   | 430    | 117.75                | 1.3      | 4.84E-04          | 19   | 2.51E-03     | 16   |
| TCLP & Zwell     | 60705  | 2.6   | 3953.57        | 0.084  | 1.2                       | 14.29           | 4.1      | 0.17   | 8430   | 117.75                | 1.3      | 2.77E-04          | 8    | 2.16E-03     | 17   |
| Area & TCLP      | 420888 | 2.6   | 3953.57        | 0.084  | 1.2                       | 14.29           | 4.       | 0.17   | 65     | 238.82                | 6.5      | 3.17E-03          | 9    | 2.14E-03     | 18   |
| Area & Ywell     | 420888 | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 1.4      | 0.17   | 430    | 0.00                  | 6.5      | 3.24E-03          | 4    | 2.09E-03     | 19   |
| Area & Infil     | 420888 | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 1.4      | 0.46   | 430    | 238.82                | 6.5      | 2.61E-03          | 6    | 1.62E-03     | 20   |
| Area & Zwell     | 420888 | 2.6   | 3953.57        | 0.059  | 1.2                       | 20.34           | 4.1      | 0.17   | 430    | 238.82                | 1.3      | 1.27E-03          | 15   | 1.23E-03     | 21   |
|                  |        |       |                |        |                           |                 |          |        |        |                       |          |                   |      |              |      |

Table A.35 Sensitivity Analysis for Contingent Management of CSO Sludge, Off-Site Landfill/Benzene -- Industrial Areas, 30 Year Active Life

| Ava (m2)         (m3t) (m4t) | ř                | •      |       |         |        |     |         |          |        |        |        |     | 1997        |      | 1998         |      |
|--|------------------|--------|-------|---------|--------|-----|---------|----------|--------|--------|--------|-----|-------------|------|--------------|------|
| (m2)         (m)         (m3)         (mg/L)         (mg/kg)         (L/kg)         (g/cm3)         (m/Y)         (m)         (m)         (mg/L)         Rank  | wo-rarameters    | Area   | Depth | WSt. Vo |        |     | <u></u> | Wst. Den | Infil  | X-well | Y-Well |     | 9-year Avg. |      | 9-vear Avg.  |      |
| 20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         66.91         6.5         4.77E-04         2.23E-03         6         1.78E-02         1         2.23E-03         6         1.78E-02         1         1  | at High End      | (m2)   | Œ     | (m3)    | (mg/L) |     | (L/kg)  |          | (m/yr) | Ê      | (m)    | Œ   | )           | Rank | Conc. (mg/L) | Rank |
| 20200         2.6         6.75         6.75         1.2         20.34         1.4         0.46         102         60.76         6.5         3.05E-03         6         1.7BE-02           162000         2.6         6.7360         0.059         1.2         20.34         1.4         0.17         430         165.01         6.5         1.55E-02         1         1.4ZE-02           20200         2.6         67360         0.059         1.2         20.34         1.4         0.17         102         0.00         6.5         1.5EE-02         1         1.4ZE-02           20200         2.6         67360         0.059         1.2         20.34         1.4         0.17         102         60.76         6.5         1.4EE-02         1         1.4EE-02           20200         2.6         67360         0.059         1.2         20.34         1.4         0.17         102         60.76         6.5         1.4EE-02         1         1.7EE-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         420         6.07         6.5         1.4EE-03         1         1.7EE-02           1         20200  | ise Case         | 20200  | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 430    | 85.91  | 6.5 | 4.77E-04    |      | 2.23E-03     |      |
| 162000         2.6         67360         0.059         1.2         20.34         1.4         0.17         430         16501         6.5         1.55E-02         1         1.42E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         102         6.07         6.5         1.08E-03         4         1.14E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         102         60.76         6.5         1.08E-03         4         1.14E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         102         60.76         6.5         1.44E-03         13         1.03E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         40         6.76         6.5         1.44E-03         13         1.03E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         6.06         5         1.44E-03         13         1.14E-03           20200         2.6   | Vell & Infil     | 20200  | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.46   | 102    | 60.76  | 6.5 | 3.05E-03    | 9    | 1.78E-02     | -    |
| 20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         102         6.06         6.5         3.22E-03         4         1.14E-02           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         102         60.76         6.5         1.08E-03         1         1.14E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         102         60.76         6.5         1.44E-03         13         1.03E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         102         60.76         6.5         1.4E-03         13         1.03E-02           1         20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         1         1.03E-03           1         20200         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         6.06         6.5         2.16E-03         1         1.03E-03   | st. Vol & Area   | 162000 | 2.6   | 67350   | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 430    | 165.01 | 6.5 | 1.55E-02    | -    | 1.42E-02     | 2    |
| 20200         2.6         67360         0.059         1.2         20.34         1.4         0.17         102         60.76         6.5         1.08E-03         16         1.07E-02           20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         102         60.76         6.5         1.44E-03         13         1.03E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         4.81E-03         3         1.03E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         10         8.93E-03           10         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         1         2.8E-03           10         20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         1         2.9E-03 <t< td=""><td>Vell &amp; Y- Well</td><td>20200</td><td>2.6</td><td>3750</td><td>0.059</td><td>1.2</td><td>20.34</td><td>1.4</td><td>0.17</td><td>102</td><td>0.00</td><td>6.5</td><td>3.22E-03</td><td>4</td><td>1.14E-02</td><td>3</td></t<>   | Vell & Y- Well   | 20200  | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 102    | 0.00   | 6.5 | 3.22E-03    | 4    | 1.14E-02     | 3    |
| 20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         102         60.76         6.5         1.4E-03         13         1.0BE-02           20200         2.6         3750         0.069         1.2         20.34         1.4         0.46         430         0.00         6.5         4.81E-03         3         1.0BE-02           20200         2.6         3750         0.069         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         1.0         9.5BE-03           20200         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         1.0         8.9E-03           1         20200         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         6.5         2.16E-03         1.7         8.9E-03           20200         2.6         3750         0.084         1.2         20.34         1.4         0.46         430         85.9I         6.5         2.16E-03         1.7         7.9E-03           20200         2.6  | st. Vol & X-Well | 20200  | 2.6   | 67350   | 0.059  | 1.2 | 20.34   | 4.1      | 0.17   | 102    | 60.76  | 6.5 | 1.08E-03    | 16   | 1.07E-02     | 4    |
| 20200         2.6         3750         0.059         1.2         20.34         1.4         0.46         430         0.00         6.5         4.81E-03         3         1.03E-02           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         6.06         6.5         2.16E-03         1.2         9.53E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         1.0         8.93E-03           162000         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         1.0         8.93E-03           162000         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         6.5         5.34E-03         1.0         8.93E-03           20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         6.5         1.34E-03         1.4         7.85E-03           162000         2.6         3750         0.084<   | Vell & TCLP      | 20200  | 5.6   | 3750    | 0.084  | 1.2 | 14.29   | 1.4      | 0.17   | 102    | 60.76  | 6.5 | 1.44E-03    | 13   | 1.03E-02     | . 5  |
| 20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         402         60.76         4.3         1.53E-03         12         9.35E-03           II         20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         10         8.93E-03           162000         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         10         8.93E-03           162000         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         2.16E-03         10         8.93E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         6.5         6.3E-03         1.4         7.85E-03           20200         2.6         67350         0.084         1.2         14.29         1.4         0.17         430         85.91         6.5         6.9E-03         1.4         7.35E-03           162000<   | Vell & Infil     | 20200  | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.46   | 430    | 0.00   | 6.5 | 4.81E-03    | 6    | 1.03E-02     | ي ر  |
| 1  | /ell & Z-Well    | 20200  | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 102    | 60.76  | 1.3 | 1.53E-03    | 12   | 9.53E-03     |      |
| 20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         0.00         6.5         2.86E-03         8         8.16E-03           162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         102         142.35         6.5         5.34E-03         2         7.93E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.46         430         85.91         6.5         1.34E-03         1.4         7.85E-03           20200         2.6         67350         0.084         1.2         14.29         1.4         0.46         430         85.91         6.5         1.34E-03         1.7         7.85E-03           162000         2.6         67350         0.084         1.2         14.29         1.4         0.17         430         85.91         6.5         6.99E-04         18         4.31E-03           162000         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         0.60         6.5         0.99E-04         18         4.11E-03           162000         2.   | I. Vol & Y- Well | 20200  | 2.6   | 67350   | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 430    | 0.00   | 6.5 | 2.16E-03    | 9    | 8.93E-03     | 8    |
| 162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         102         142.35         6.5         5.34E-03         2         7.93E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.46         430         85.91         6.5         1.34E-03         1.4         7.85E-03           20200         2.6         67350         0.084         1.2         14.29         1.4         0.46         430         85.91         6.5         1.63E-03         1.1         7.85E-03           20200         2.6         67350         0.084         1.2         14.29         1.4         0.17         430         85.91         6.5         1.63E-03         1.1         5.25E-03           162000         2.6         67350         0.084         1.2         14.29         1.4         0.17         430         6.5         3.08E-03         1.8         4.11E-03           162000         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         165.01         6.5         3.02E-03         1.7         3.14E-03           20200         2.6         <   | /ell & TCLP      | 20200  | 2.6   | 3750    | 0.084  | 1.2 | 14.29   | 1.4      | 0.17   | 430    | 0.00   | 6.5 | 2.86E-03    | 8    | 8.16E-03     | 6    |
| 20200         2.6         67350         0.059         1.2         20.34         1.4         0.46         430         85.91         6.5         1.34E-03         14         7.85E-03           20200         2.6         3750         0.084         1.2         14.29         1.4         0.46         430         85.91         6.5         1.63E-03         11         5.25E-03           20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         85.91         6.5         6.99E-04         18         4.33E-03           162000         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         6.5         6.59E-03         17         3.63E-03           162000         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         165.01         6.5         3.02E-03         7         3.63E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         1.3         9.4F-04         17         3.14E-03           20200         2.6         3750         0.059 <td>ell &amp; Area</td> <td>162000</td> <td>2.6</td> <td>3750</td> <td>0.059</td> <td>1.2</td> <td>20.34</td> <td>1.4</td> <td>0.17</td> <td>102</td> <td>142.35</td> <td>6.5</td> <td>5.34E-03</td> <td>2</td> <td>7.93E-03</td> <td>10</td>   | ell & Area       | 162000 | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 102    | 142.35 | 6.5 | 5.34E-03    | 2    | 7.93E-03     | 10   |
| 20200         2.6         3750         0.084         1.2         14.29         1.4         0.46         430         85.91         6.5         1.63E-03         11         5.25E-03           20200         2.6         67350         0.084         1.2         14.29         1.4         0.17         430         85.91         6.5         6.99E-04         18         4.33E-03           162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         6.5         3.08E-03         7         3.63E-03           162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         6.5         3.02E-03         7         3.63E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         6.5         2.47E-03         9         3.41E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         65.91         1.3         4.81E-04         19         1.9E-03           4         162000         2.6         3750         0.059   | . Vol & Infil    | 20200  | 2.6   | 67350   | 0.059  | 1.2 | 20.34   | 4.1      | 0.46   | 430    | 85.91  | 6.5 | 1.34E-03    | 4    | 7.85E-03     | =    |
| 20200         2.6         67350         0.084         1.2         14.29         1.4         0.17         430         65.91         6.5         6.99E-04         18         4.33E-03           162000         2.6         3750         0.084         1.2         20.34         1.4         0.17         430         0.00         6.5         3.08E-03         5         4.11E-03           162000         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         165.01         6.5         3.02E-03         7         3.41E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         1.3         9.47E-04         17         3.14E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         4.81E-04         19         1.97E-03           162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         4.81E-04         19         1.97E-03           20200         2.6         67350 </td <td>P&amp;Infil</td> <td>20200</td> <td>2.6</td> <td>3750</td> <td>0.084</td> <td>1.2</td> <td>14.29</td> <td>1.4</td> <td>0.46</td> <td>430</td> <td>85.91</td> <td>6.5</td> <td>1.63E-03</td> <td>E</td> <td>5.25E-03</td> <td>12</td>   | P&Infil          | 20200  | 2.6   | 3750    | 0.084  | 1.2 | 14.29   | 1.4      | 0.46   | 430    | 85.91  | 6.5 | 1.63E-03    | E    | 5.25E-03     | 12   |
| 162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         0.00         6.5         3.08E-03         5         4.11E-03           162000         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         165.01         6.5         3.02E-03         7         3.63E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         6.5         2.47E-03         9         3.41E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         4.81E-04         17         3.14E-03           16200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         4.81E-04         19         1.79E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04         21         1.49E-03           20200         2.6 </td <td>. Vol &amp; TCLP</td> <td>20200</td> <td>2.6</td> <td>67350</td> <td>0.084</td> <td>1.2</td> <td>14.29</td> <td>1.4</td> <td>0.17</td> <td>430</td> <td>85.91</td> <td>6.5</td> <td>6.99E-04</td> <td>92</td> <td>4.33E-03</td> <td>13</td>  | . Vol & TCLP     | 20200  | 2.6   | 67350   | 0.084  | 1.2 | 14.29   | 1.4      | 0.17   | 430    | 85.91  | 6.5 | 6.99E-04    | 92   | 4.33E-03     | 13   |
| 162000         2.6         3750         0.084         1.2         1.4         0.17         430         165.01         6.5         3.02E-03         7         3.63E-03           162000         2.6         3750         0.059         1.2         20.34         1.4         0.46         430         165.01         6.5         2.47E-03         9         3.41E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         4.81E-04         17         3.14E-03           162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         4.81E-04         17         1.79E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         1.21E-03         15         1.79E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04         20         1.49E-03           20200         2.6         37   | ell & Area       | 162000 | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 430    | 0.00   | 6.5 | 3.08E-03    | 5    | 4.11E-03     | 14   |
| 162000         2.6         3750         0.059         1.2         20.34         1.4         0.46         430         165.01         6.5         2.47E-03         9         3.41E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         0.00         1.3         9.47E-04         17         3.14E-03           16200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         4.81E-04         19         1.97E-03           16200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         4.81E-04         19         1.78E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04         21         1.49E-03           20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         85.91         1.3         2.75E-04         20         1.37E-03   | P & Area         | 162000 | 2.6   | 3750    | 0.084  | 1.2 | 14.29   | 4.1      | 0.17   | 430    | 165.01 | 6.5 | 3.02E-03    | -    | 3.63E-03     | 15   |
| 20200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         0.00         1.3         9.47E-04         17         3.14E-03           20200         2.6         3750         0.059         1.2         20.34         1.4         0.46         430         85.91         1.3         4.81E-04         19         1.97E-03           16200         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         4.81E-04         19         1.97E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04         21         1.49E-03           20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         85.91         1.3         2.75E-04         20         1.37E-03  | & Area           | 162000 | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.46   | +      | 165.01 | 6.5 | 2.47E-03    | 6    | 3.41E-03     | 19   |
| 20200         2.6         3750         0.059         1.2         20.34         1.4         0.46         430         85.91         1.3         4.81E-04         19         1.97E-03           162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         1.21E-03         15         1.79E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04         21         1.49E-03           20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         85.91         1.3         2.75E-04         20         1.37E-03   | ell & Z-Well     | 20200  | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 430    | 0.00   | 1.3 | 9.47E-04    | 17   | 3.14E-03     | 12   |
| 162000         2.6         3750         0.059         1.2         20.34         1.4         0.17         430         165.01         1.3         1.21E-03         15         1.79E-03           20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04         21         1.49E-03           20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         85.91         1.3         2.75E-04         20         1.37E-03  | & Z-Well         | 20200  | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.46   | 430    | 85.91  | 1.3 | 4.81E-04    | 19   | 1.97E-03     | 18   |
| 20200         2.6         67350         0.059         1.2         20.34         1.4         0.17         430         85.91         1.3         2.08E-04         21         1.49E-03           20200         2.6         3750         0.084         1.2         14.29         1.4         0.17         430         85.91         1.3         2.75E-04         20         1.37E-03   | & Z-Well         | 162000 | 2.6   | 3750    | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 430    | 165.01 | 1.3 | 1.21E-03    | 15   | 1.79E-03     | 19   |
| 20200 2.6 3750 <b>0.084</b> 1.2 <b>14.29</b> 1.4 <b>0.17</b> 430 85.91 <b>1.3</b> 2.75E-04 20 1.37E-03   | Vol. & Z-Well    | 20200  | 2.6   | 67350   | 0.059  | 1.2 | 20.34   | 1.4      | 0.17   | 430    | 85.91  | 1.3 | 2.08E-04    | 21   | 1.49E-03     | 20   |
|  | P & Z-Well       | 20200  | 2.6   | 3750    | 0.084  | 1.2 | 14.29   | 1.4      | 0.17   | 430    | 85.91  | 1.3 | 2.75E-04    | 8    | 1.37E-03     | 21   |

Table A.36 Sensitivity Analysis for Contingent Management of CSO Sludge, Off-Site Landfill/Benzene -- Municipal Areas, 30 Year Active Life

|  | 1               |                               |      |        |                       | -                 | /661         |      | 1998              |          |
|--|-----------------|-------------------------------|------|--------|-----------------------|-------------------|--------------|------|-------------------|----------|
| K-Well         60705         2.6         3750         0.059           Area         420888         2.6         67350         0.059           Area         420888         2.6         67350         0.059           Area         420888         2.6         67350         0.059           - Well         60705         2.6         3750         0.059           - Well         60705         2.6         3750         0.059           Rell         60705         2.6         3750         0.059           CLP         60705         2.6         3750         0.059           CLP         60705         2.6         3750         0.059           Aveil         60705         2.6         3750         0.069           Aveil         60705         2.6  | (ma/ka)         | (ma/ka) (L/ka) (a/cm3) (m/yr) |      | X-Well | A-well Y- Well Z-Well | Z-Well            | 9-year Avg.  |      | 9-year Avg.       |          |
| K-Well         60705         2.6         67350         0.059           Area         420888         2.6         67350         0.059           Area         420888         2.6         67350         0.059   | 12              |                               | 0 47 | 430    | 447 75                | 1                 | conc. (mg/L) |      | Rank Conc. (mg/L) | Kank     |
| Area 420888 2.6 67350 0.059 Area 420888 2.6 67350 0.059 Area 420888 2.6 67350 0.059 Area 60705 2.6 3750 0.059  | ! ;             | 1                             | 3    | 3      | 07.7                  | 0.0               | 4.//E-04     |      | 3.64E-03          |          |
| Area 420888 2.6 67350 0.059 Area 420888 2.6 67350 0.059 Area 60705 2.6 3750 0.059 Arell 60705 2.6 3750 0.059   | 7.1             | 20.34 1.4                     | 0.17 | 102    | 93.79                 | 6.5               | 1.08E-03     | 16   | 2.21E-02          | -        |
| Area 420888 2.6 67350 0.059 (67350 0.059 0.059 (67350 0.059 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (67350 0.059 (673 | 1.2             | 20.34 1.4                     | 0.46 | 430    | 117.75                | 6.5               | 1.34E-03     | 14   | 1.69E-02          | 2        |
| - Well 60705 2.6 3750 0.059 Well 60705 2.6 67350 0.059 P 60705 2.6 3750 0.059 Well 60705 2.6 3750 0.059 CLP 60705 2.6 3750 0.059 CWell 60705 2.6 3750 0.059  | 1.2             | 20.34 1.4                     | 0.17 | 430    | 238.82                | 6.5               | 1.55E-02     | -    | 1 66E-02          | , 6      |
| Well         60705         2.6         67350         0.059           P 60705         2.6         3750         0.084           Well         60705         2.6         3750         0.084           Vell         60705         2.6         3750         0.084           LP         60705         2.6         3750         0.084           LP         60705         2.6         3750         0.059           SWell         60705         2.6         3750         0.059           Auli         60705         2.6         67350         0.059           Fell         60705         2.6         3750         0.084           A20888         2.6         3750         0.084           A20888         2.6         3750         0.084  | 1.2             | 20.34 1.4                     | 0.46 | 102    | 93.79                 | 6.5               | 3.05E-03     | - (4 | 1 465 00          | ,        |
| P         60705         2.6         3750         0.084           Vell         60705         2.6         3750         0.059           Vell         60705         2.6         3750         0.059           CLP         60705         2.6         3750         0.084           LP         60705         2.6         3750         0.084           CVWell         60705         2.6         3750         0.059           AVWell         60705         2.6         67350         0.059           ALORSS         2.6         3750         0.059           ALORSS         2.6         3750         0.059           ALORSS         2.6         3750         0.084           ALORSS         2.6         3750         0.084           ALORSS         2.6         3750         0.084           ALORSS         2.6         3750         0.084   | 1.2             | 20.34 1.4                     | 0.17 | 430    | 000                   | 6.5               | 2.00E 03     | 9 5  | 1 365 00          | <b>+</b> |
| Well         60705         2.6         3750         0.059           CLP         60705         2.6         3750         0.059           CLP         60705         2.6         3750         0.084           LP         60705         2.6         3750         0.059           60705         2.6         3750         0.059           2-Well         60705         2.6         67350         0.059           ell         60705         2.6         3750         0.059           ell         60705         2.6         3750         0.059           ell         60705         2.6         3750         0.084           ell         60705         2.6         3750         0.084           ell         60705         2.6         3750         0.084   | 1.2             | 14.29 1.4                     | 0.17 | 102    | 93.79                 | 6.5               | 1 44F-03     | 2 5  | 1.30E-02          | 0        |
| Vell         60705         2.6         3750         0.059           CLP         60705         2.6         67350         0.084           LP         60705         2.6         3750         0.084           60705         2.6         3750         0.059           2-Well         60705         2.6         67350         0.059           a         42088         2.6         3750         0.059           fell         60705         2.6         3750         0.059           fell         60705         2.6         3750         0.059           fell         60705         2.6         3750         0.084           d20888         2.6         3750         0.084   | 1.2             | 20.34 1.4                     | 0.17 | 102    | 0.00                  | 6.5               | 3 22F-03     | 2 -  | 1.35E-02          | 0 1      |
| CLP 60705 2.6 67350 0.084  LP 60705 2.6 3750 0.084  60705 2.6 3750 0.084  60705 2.6 3750 0.059  2-Well 60705 2.6 67350 0.059  a 420888 2.6 3750 0.059  fell 60705 2.6 3750 0.059  a 420888 2.6 3750 0.084  a 420888 2.6 3750 0.084   | 1.2             | 20.34 1.4                     | 0.17 | 102    | 93.79                 | 13                | 1.53F-03     | - 2  | 1.23E-02          | -   •    |
| LP 60705 2.6 3750 <b>0.084</b> 60705 2.6 3750 0.059 60705 2.6 3750 0.059 60705 2.6 <b>67350</b> 0.059 ell 60705 2.6 3750 0.059 ell 60705 2.6 3750 0.059 ell 60705 2.6 3750 0.084  | 1.2             | 14.29 1.4                     | 0.17 | 430    | 117.75                | 6.5               | 6.99E-04     | ! œ  | 1.05E-02          | 0        |
| 60705 2.6 3750 0.059 60705 2.6 3750 0.084 60705 2.6 67350 0.059 a 420888 2.6 3750 0.059 60705 2.6 3750 0.059 60705 2.6 3750 0.059 60705 2.6 3750 0.084 420888 2.6 3750 0.084   | 1.2             | 14.29 1.4                     | 0.17 | 430    | 0.00                  | 6.5               | 2.86E-03     | 2 00 | 7 47F-03          | , 6      |
| A 20888 2.6 3750 0.084   2-Well 60705 2.6 67350 0.059   420888 2.6 3750 0.059   60705 2.6 3750 0.059   60705 2.6 3750 0.059   81 60705 2.6 3750 0.084   420888 2.6 3750 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084    8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084   8350 0.084    8350 0.084   8350 0.084    8350 0.085 0.084    8350 0.085 0.084    8350 0.085 | 1.2             | 20.34 1.4                     | 0.46 | 430    | 0.00                  | 6.5               | 4 R1E-03     | , "  | 7 135 03          | 2 7      |
| A 420888 2.6 67350 0.059   420888 2.6 3750 0.059   fell 60705 2.6 3750 0.059   60705 2.6 3750 0.059   fell 60705 2.6 3750 0.084   420888 2.6 3750 0.084   fell 60705 3.750 0.085   fe | 1.2             | 14.29 1.4                     | 0.46 | ╈      | 117 75                | 2 4               | 1 635 03     | , ‡  | 7 . 13E-03        | =        |
| 420888 2.6 3750 0.059   60705 2.6 3750 0.059   60705 2.6 3750 0.059   60705 2.6 3750 0.084   420888 2.6 3750 0.084   420888 2.6 3750 0.084   420888 2.6 3750 0.084   420888 2.6 3750 0.084   420888 2.6 3750 0.050   420888    | 12              | $\perp$                       | 71.0 | +      | 447 75                | 2 .               | 1.035-03     | =    | 3.40E-U3          | 2        |
| fell         60705         2.6         3750         0.059           60705         2.6         3750         0.059           81         60705         2.6         3750         0.084           420888         2.6         3750         0.084   | 12              | 1                             | 1    | +      | 27.7.2                | 3 6               | 2.08E-04     | .7   | 3.75E-03          | 13       |
| 60705 2.6 3750 0.059<br>60705 2.6 3750 0.084<br>420888 2.6 3750 0.084  | 1,0             | 1                             | 2,00 | +      | 70.717                | 0.0               | 5.34E-03     | 7    | 3.41E-03          | 14       |
| 420888 2.6 3750 0.084 420888 2.6 3750 0.084  | c               | 1                             | 2 5  | +      | 0.00                  | 2                 | 9.47E-04     | 14   | 3.21E-03          | 15       |
| 420888 2.6 3750 0.084<br>420888 2.6 3750 0.084   | 7.              | 4.1                           | 0.40 | 430    | 117.75                | <del>ر</del><br>ن | 4.81E-04     | 9    | 2.40E-03          | 16       |
| 420888 2.6 3750 0.084<br>420888 2.6 3750 0.050   | 0.084 1.2 14.29 | 1.4                           | 0.17 | 430    | 117.75                | 1.3               | 2.75E-04     | 8    | 2.09E-03          | 17       |
| 420888 2 8 3750 0.050  | 0.084 1.2 14.29 | 29 1.4                        | 0.17 | 430    | 238.82                | 6.5               | 3.02E-03     | _    | 2.03E-03          | 180      |
| 2:0  | 0.059 1.2 20.34 | 34 1.4                        | 0.17 | 430    | 0.00                  | 6.5               | 3.08E-03     | 2    | 1.99E-03          | 19       |
| <b>420888</b> 2.6 3750 0.059   | 0.059 1.2 20.34 | 34 1.4                        | 0.46 | 430 2  | 238.82                | 6.5               | 2.47E-03     | 6    | 1.54E-03          | 2        |
| Area & Z-Well 420888 2.6 3750 0.059 1  | 0.059 1.2 20.34 | 34 1.4                        | 0.17 | 430    | 238.82                | 1.3               | 1.21E-03     | 15   | 1 17F-03          | 7        |

Table A.37 Sensitivity Analysis for Crude Oil tank sediment Off-Site Landfill /Benzene -- Industrial Landfills, 30 year Active Life

|                      |        |       |          |        |          |         |                |        |        |                |        | 1997         |      | 1998         |      |
|----------------------|--------|-------|----------|--------|----------|---------|----------------|--------|--------|----------------|--------|--------------|------|--------------|------|
| Two-Parameters       | Area   | Depth | Wst. Vol | TCLP   | Wst Conc | Cw / Cl | Wst. Den       | Infil  | X-well | X-well Y- Well | Z-Well | 9-year Avg.  |      | 9-year Avg.  |      |
| at High End          | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg)  | (□/kg)  | (g/cm3) (m/yr) | (m/yr) | Œ      | (m)            | (E)    | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case            | 20200  | 2.6   | 98.389   | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 430    | 85.91          | 6.5    | 5.12E-03     |      | 2.43E-02     |      |
| Infil & Xwell        | 20200  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52           | 0.46   | 102    | 92.09          | 6.5    | 3.32E-02     | 80   | 1.91E-01     | -    |
| Area & Wst. Vol      | 162000 | 2.6   | 12473.7  | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 430    | 165.01         | 6.5    | 1.71E-01     | -    | 1.57E-01     | 2    |
| TCLP & xwell         | 20200  | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52           | 0.17   | 102    | 60.76          | 6.5    | 2.59E-02     | 12   | 1.56E-01     | က    |
| Ywell & Xwell        | 20200  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 102    | 0.00           | 6.5    | 3.44E-02     | 7    | 1.24E-01     | 4    |
| Ywell & TCLP         | 20200  | 5.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52           | 0.17   | 430    | 0.00           | 6.5    | 5.11E-02     | 9    | 1.20E-01     | 5    |
| Xwell & Wst Vol      | 20200  | 2.6   | 12473.7  | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 102    | 60.76          | 6.5    | 1.20E-02     | 20   | 1.13E-01     | 9    |
| Xwell & Wst. Conc    | 20200  | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52           | 0.17   | 102    | 60.76          | 6.5    | 1.16E-02     | 22   | 1.10E-01     | 7    |
| Ywell & Infil        | 20200  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52           | 0.46   | 430    | 0.00           | 6.5    | 5.24E-02     | 4    | 1.09E-01     | ω    |
| Xwell & Zwell        | 20200  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 102    | 60.76          | 1.3    | 1.64E-02     | 16   | 1.04E-01     | 6    |
| Ywell & Wst. Vol     | 20200  | 2.6   | 12473.7  | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 430    | 0.00           | 6.5    | 2.40E-02     | 14   | 9.45E-02     | 9    |
| Area & Wst. Conc     | 162000 | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52           | 0.17   | 430    | 165.01         | 6.5    | 8.02E-02     | 2    | 9.23E-02     | =    |
| Ywell & Wst Conc     | 20200  | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52           | 0.17   | 430    | 0.00           | 6.5    | 2.33E-02     | 15   | 8.95E-02     | 12   |
| Area & Xwell         | 162000 | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 102    | 142.35         | 6.5    | 5.18E-02     | 5    | 8.64E-02     | 13   |
| Infil & Wst. Vol     | 20200  | 2.6   | 12473.7  | 0.679  | 58.72    | 86.48   | 1.52           | 0.46   | 430    | 85.91          | 6.5    | 5.85E-02     | 3    | 8.63E-02     | 14   |
| TCLP & Wst. Vol      | 20200  | 2.6   | 12473.7  | 1.7    | 58.72    | 34.54   | 1.52           | 0.17   | 430    | 85.91          | 6.5    | 1.30E-02     | 19   | 8.40E-02     | 15   |
| Infil & Wst. Conc    | 20200  | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52           | 0.46   | 430    | 85.91          | 6.5    | 1.44E-02     | 17   | 7.23E-02     | 16   |
| TCLP & Wst Conc      | 20200  | 2.6   | 685.86   | 1.7    | 220      | 129.41  | 1.52           | 0.17   | 430    | 85.91          | 6.5    | 1.34E-02     | 18   | 6.67E-02     | 17   |
| Infil & TCLP         | 20200  | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52           | 0.46   | 430    | 85.91          | 6.5    | 2.71E-02     | 11   | 6.65E-02     | 18   |
| Area & Ywell         | 162000 | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 430    | 0.00           | 6.5    | 3.00E-02     | 6    | 4.53E-02     | 19   |
| Area & TCLP          | 162000 | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52           | 0.17   | 430    | 165.01         | 6.5    | 2.85E-02     | 10   | 4.01E-02     | 20   |
| Area & Infil         | 162000 | 2.6   | 685.86   | 629'0  | 58.72    | 86.48   | 1.52           | 0.46   | 430    | 165.01         | 6.5    | 2.44E-02     | 13   | 3.89E-02     | 21   |
| Ywell & Zwell        | 20200  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 430    | 0.00           | 1.3    | 1.02E-02     | 23   | 3.41E-02     | 22   |
| Wst. Vol & Wst. Conc | 20200- | 2.6   | 12473.7  | 0.679  | 220      | 324.01  | 1.52           | 0.17   | 430    | 85.91          | 6.5    | 5.95E-03     | 24   | 3.36E-02     | 23   |
| Infil & Zweil        | 20200  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52           | 0.46   | 430    | 85.91          | 1.3    | 5.24E-03     | 22   | 2.09E-02     | 24   |
| TCLP & Zwell         | 20200  | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52           | 0.17   | 430    | 85.91          | 1.3    | 4.91E-03     | 56   | 2.01E-02     | 25   |
| Area & Zwell         | 162000 | 2.6   | 685.86   | 6/9'0  | 58.72    | 86.48   | 1.52           | 0.17   | 430    | 165.01         | 1.3    | 1.17E-02     | 21   | 1.96E-02     | 56   |
| Wst. Vol & Zwell     | 20200  | 2.6   | 12473.7  | 0.679  | 58.72    | 86.48   | 1.52           | 0.17   | 430    | 85.91          | 1.3    | 2.31E-03     | 27   | 1.58E-02     | 27   |
| Wst Conc & Zwell     | 20200  | 2.6   | 685.86   | 629.0  | 220      | 324.01  | 1.52           | 0.17   | 430    | 85.91          | 1.3    | 2.22E-03     | 28   | 1.50E-02     | 28   |
|                      |        |       |          |        |          |         |                |        |        |                |        |              |      |              |      |

| Two Dammaton               | _      |         |          | i      |                     |                     | ,        |                 |        |                       |        | 1997         |        | 1998        |          |
|----------------------------|--------|---------|----------|--------|---------------------|---------------------|----------|-----------------|--------|-----------------------|--------|--------------|--------|-------------|----------|
| at High End                | (m2)   | (a) (b) | (m3)     | (ma/L) | Wst Conc<br>(ma/ka) | Ω (§/<br>(ξ/<br>(ξ/ | Wst. Den | Infil<br>(m/vr) | X-well | X-well Y- Well Z-Well | Z-Well | I            |        | 9-year Avg. |          |
| Base Case                  | 20200  | 2.6     | 685.86   | 0.5    | 58 72               | 117 44              |          | 7,40            | ) Sec  | (III)                 |        | conc. (mg/L) | ž<br>Ž | <u> </u>    | Rank     |
| Xwell & Wat Vol            | 20200  | 4       | 02 62767 | 2 0    | 21.00               | F                   | 70.      | 5               | 3      | 80.8                  | 0.0    | 3.94E-03     |        | 4.96E-02    |          |
| Infl: 9-14/54 1/51         | 20200  | 4       | 12473.70 | C.3    | 28.72               | 117.44              | 1.52     | 0.17            | 102    | 92.09                 | 6.5    | 9.07E-03     | 18     | 2.03E-01    | -        |
| x vvst. voi                | 20200  | -4      | 12473.70 | 0.5    | 58.72               | 117.44              | 1.52     | 0.46            | 430    | 85.91                 | 6.5    | 1.06E-02     | 16     | 1 82F-01    | 6        |
| Xwell & Wst. Conc          | 20200  |         | 685.86   | 0.5    | 220                 | 440.00              | ₹ 1.52   | 0.17            | 102    | 60.76                 | 6.5    | 8.65E-03     | 6      | 1 70F-01    | 1 ~      |
| Infil & Xwell              | 20200  | 2.6     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.46            | 102    | 60 76                 | 6.5    | 2 56E-02     | 2 0    | 1 450 04    | <u>,</u> |
| Infil & Wst. Conc          | 20200  | 2.6     | 685.86   | 0.5    | 220                 | 440.00              | 1.52     | 0.46            | 430    | 85.91                 | 6.5    | 1 07E 02     | , 4    | 1.43E-01    | + 1      |
| Area & Wst. Vol            | 162000 | 2.6     | 12473.70 | 0.5    | 58.72               | 117.44              | 1.52     | 0.17            | 65     | 165.04                | 2 4    | 1345 04      | 2 ,    | 1.27 E-01   | n        |
| Ywell & Wst. Vol           | 20200  | 2.6     | 12473.70 | 0.5    | 58.72               | 117.44              | 1.52     | 0.17            | £ 8    |                       | 2 4    | 1.045-01     | -   5  | 1.22E-01    | ا ۵      |
| Ywell & Xwell              | 20200  | 2.6     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.17            | 162    | 8 8                   | 6.5    | 2 67E-02     | 2 ^    | 1 420 04    | \        |
| Xwell & Zwell              | 20200  | 2.6     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.17            | 102    | 60 76                 | 2 6    | 1 27E 02     | - \$   | 1.135-01    | 0        |
| Wst. Vol & Wst. Conc 20200 | 20200  | 26      | 12473.70 | 0.5    | 220                 | 440.00              | 4 53     | 1,1             |        |                       |        | 1.27.202     | 2      | 1.01E-01    | S        |
| Ywell & Wet Conc           | 20200  | 3 6     | 20 202   | 2 2    | 2 6                 | 20.05               | 75.7     | 2               | 3      | 25.5                  | 0.5    | 4.41E-03     | 22     | 9.68E-02    | 9        |
| Area & Yandii              | 46200  | 0 0     | 000.00   | 0 1    | 277                 | 440.00              | 1.52     | 0.17            | 430    | 0.00                  | 6.5    | 1.74E-02     | 11     | 9.35E-02    | 11       |
| x Aweii                    | 10700  | 7.0     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.17            | 102    | 142.35                | 6.5    | 4.94E-02     | 3      | 8.07E-02    | 12       |
| Area & Wst. Conc           | 162000 | 5.6     | 685.86   | 0.5    | 220                 | 440.00              | 1.52     | 0.17            | 430    | 165.01                | 6.5    | 7.14E-02     | 7      | 7.87E-02    | 13       |
| Ywell & Infil              | 20200  | 2.6     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.46            | 88     | 0.00                  | 6.5    | 4.04E-02     | 4      | 7.06E-02    | 14       |
| Wst. Vol & Zwell           | 20200  | 5.6     | 12473.70 | 0.5    | 58.72               | 117.44              | 1.52     | 0.17            | 430    | 85.91                 | 1.3    | 1.74E-03     | 8      | 4 74F-02    | . 5      |
| Area & Ywell               | 162000 | 2.6     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.17            | 83     | 0.0                   | 6.5    | 2.92E-02     | 2      | 4.28E-02    | 2 9      |
| & Zwell                    | 20200  | 2.6     | 685.86   | 0.5    | 220                 | 440.00              | 1.52     | 0.17            | 8      | 85.91                 | 1.3    | 1.67E-03     | 27     | 3.89E-02    | 17       |
|                            | 162000 | 2.6     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.46            | 430    | 165.01                | 6.5    | 2.41E-02     | 6      | 3 815-02    | <u>~</u> |
| Infil & Zwell              | 20200  | 2.6     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.46            | 83     | 85.91                 | 1.3    | 4.04E-03     | 77     | 3.01E-02    | 2 0      |
| =                          | 20200  | 2.6     | 685.86   | 0.5    | 58.72               | 117.44              | 1.52     | 0.17            | 430    | 90.0                  | 1.3    | 7.81E-03     | 2      | 2 Q1E-02    | 2 8      |
| 4702 X AMP                 |        |         |          |        |                     |                     |          |                 |        |                       |        |              |        | 70-110-7    | :        |

Table A.39 Sensitivity Analysis for Crude Oil tank sediment Off-Site Landfill /Benzene -- Municipal Landfills, 30 year Active Life

| 9-year Avg.  20 2.39E-02 22 1.99E-01 3 1.89E-01 13 1.89E-01 14 1.79E-01 15 1.65E-01 16 1.22E-01 17 1.22E-01 18 1.18E-01 16 1.12E-01 16 8.89E-02 24 8.77E-02 24 7.66E-02 27 4.09E-02 27 2.56E-02 28 3.26E-02 29 3.26E-02 29 3.26E-02 20 3.35E-02 20 3.35E-02 21 3.35E-02 22 2.58E-02 23 3.35E-02 24 3.26E-02 25 2.58E-02 26 2.49E-02 27 4.09E-02 28 3.26E-02 29 3.26E-02 20 3.35E-02 21 3.35E-02 22 2.38E-02 23 3.35E-02 24 3.36E-02 25 2.38E-02 26 2.49E-02 27 4.09E-02 28 3.26E-02 29 2.27E-02 10 2.23E-02 11 3.48E-02  |                   |        |       |          |        |          |         |          |        |        |         | L        | 1997         |      | 1998         |      |
|--|-------------------|--------|-------|----------|--------|----------|---------|----------|--------|--------|---------|----------|--------------|------|--------------|------|
| Figure   (m2)   (m3)    Two-Parameters    | Area   | Depth | Wst. Vol | 7      | Wst Conc | Cw / Ci | Wst. Den | Infil  | X-well | Y. Well | Z-Well   |              |      | 9-year Avg.  |      |
| Vol         60705         2.6         GebS 66         GFP         88.72         86.44         1.52         0.17         430         11776         6.5         5 102E-03         3 90E-02           Conc         60705         2.6         1.644377         6.79         88.72         86.44         1.52         0.17         102         83.79         6.5         1.10E-02         2.2         1.30E-02           Conc         60705         2.6         1.24377         6.79         88.72         8.64         1.52         0.14         102         83.79         6.5         1.10E-02         2.2         1.30E-01           Vol         60705         2.6         1.24377         6.79         88.72         8.64         1.52         0.14         430         117.75         6.5         1.30E-02         2.1         1.70E-02         2.1   | at High End       | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg)  | (L/kg)  |          | (m/yr) |        | (m)     | <b>E</b> | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Vol         67705         2.6         18437.7         0.679         58.72         6.64         1.52         0.17         402         63.79         6.5         1.646.0         2.0         1.7         40.2         63.79         6.5         1.626.0         2.0         1.7         6.5         1.626.0         2.0         2.346.0         1.52         0.17         4.0         9.77         6.5         1.666.0         2.0         1.7         6.5         1.666.0         2.0         1.7         6.5         1.666.0         2.0         1.7         6.5         6.5         6.6         1.7         1.7         6.5         1.7         1.7         8.6         1.7         9.7         1.7         9.8         2.0         1.7         4.0         1.7         6.0         9.8         2.0         1.7         4.0         1.7         6.0         9.8         2.0         1.7         4.0         6.0         9.8         2.0         1.7         4.0         6.0         9.8         9.8         1.6         1.7         4.0         6.0         9.3         9.8         1.6         0.1         4.0         0.0         6.0         6.0         1.0         1.0         1.0         1.0         1.0   | Base Case         | 60705  | 2.6   | 685.86   | 211    | 58.72    | 86.48   | 1.52     | 0.17   | 430    | 117.75  | 6.5      | 5.12E-03     |      | 3.80E-02     |      |
| Conce         69705         2.6         685.86         0.679         220         334.01         1.52         0.14         402         87.9         6.5         116E-02         2.2         1.96E-01           Voil         60705         2.6         12437.7         0.679         58.72         86.48         1.52         0.46         430         11775         6.5         5.8E-02         3         1.89E-01           Voil         40705         2.6         12437.7         0.679         58.72         86.48         1.52         0.17         430         11775         6.5         5.8E-02         3         1.89E-01           Vol         42088         2.6         12437.7         0.679         58.72         86.48         1.52         0.17         430         10.75         6.5         2.5EE-02         3         1.75EE-01           Inl         67005         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         0.00         6.5         2.46E-02         3         1.75EE-01         1.75EE-02  | Xwell & Wst Vol   | 60705  | 2.6   | 12437.7  | _      | 58.72    | 86.48   | 1.52     | 0.17   | 102    | 93.79   | 6.5      | 1.20E-02     | 20   | 2.39E-01     | -    |
| VOI         60705         2.6         144377         0.67         68.48         1.52         0.44         430         117.75         6.5         5.86E-02         3         1.89E-01           I.Vol         60705         2.6         143477         1.7         58.72         34.54         1.52         0.17         430         117.75         6.5         5.00E-02         19         1.89E-01           I.Vol         60705         2.6         144877         1.7         58.72         34.54         1.52         0.17         400         58.72         6.5         3.25E-02         19         1.89E-01           I.Vol         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         6.5         3.25E-02         19         1.85E-01           I.Vol         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         6.5         3.24E-02         1.7         1.20E-02         1.7         1.20E-02         1.7         430         1.7         5.0         1.2         1.0         4.0         1.7         5.0         1.2         5.0         1.2         3.2  | Xwell & Wst. Conc | 60705  | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52     | 0.17   | 102    | 93.79   | 6.5      | 1.16E-02     | 22   | 1.99E-01     | 2    |
| Not   60705   2.6   144377   1.7   58.72   34.54   1.52   0.17   430   117.75   6.5   1.30E-02   19   1.99E-01   | Infil & Wst. Vol  | 60705  | 2.6   | 12437.7  | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 430    | 117.75  | 6.5      | 5.85E-02     | 3    | 1.89E-01     | 3    |
| VOI         420888         2.6         12437.7         0.679         58.72         96.48         1.52         0.17         430         238.82         6.5         1.71E-01         1         1.79E-01           III         60705         2.6         68.66         1.7         58.72         3.45         1.52         0.17         400         6.5         2.56E-02         1.2         1.6E-01           I. Voll         60705         2.6         68.66         0.679         58.72         86.48         1.52         0.14         402         0.00         6.5         2.56E-02         1.4         1.46E-01         1         1.75E-01           L. Voll         60705         2.6         68.68         0.679         58.72         86.48         1.52         0.17         430         0.00         6.5         2.46E-02         1.7         1.22E-01           Conc         60705         2.6         685.86         0.679         28.72         324.01         1.52         0.17         430         10.75         6.5         1.4E-02         1.7         1.20         1.7         430         10.75         6.5         1.7         1.75         6.5         1.7         1.75         6.5         1.7   | TCLP & Wst. Vol   | 60705  | 2.6   | 12437.7  | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 430    | 117.75  |          | 1.30E-02     | 19   | 1.89E-01     | 4    |
| Harrow   Gottos   2.6   685.86   1.7   58.72   34.54   1.52   0.17   102   93.79   6.5   2.59E-02   12   165E-01     Livol   Gottos   2.6   685.86   0.679   58.72   86.46   1.52   0.17   430   0.00   6.5   3.23E-02   14   1.52E-01     Livol   Gottos   2.6   685.86   0.679   58.72   86.46   1.52   0.17   430   0.00   6.5   3.44E-02   17   1.22E-01     Lonc   Gottos   2.6   685.86   0.679   220   324.01   1.52   0.17   430   0.00   6.5   3.34E-02   17   1.22E-01     Lonc   Gottos   2.6   685.86   0.679   220   324.01   1.52   0.17   430   0.00   6.5   3.34E-02   19   1.18E-01     Lonc   Gottos   2.6   685.86   0.679   220   324.01   1.52   0.17   430   117.75   6.5   1.34E-02   19   1.18E-01     Lonc   Gottos   2.6   685.86   0.679   28.72   24.54   1.52   0.17   430   117.75   6.5   1.34E-02   19   1.18E-01     Lonc   Gottos   2.6   685.86   0.679   28.72   28.45   1.52   0.17   430   117.75   6.5   2.34E-02   19   1.18E-01     Lonc   Gottos   2.6   685.86   0.679   28.72   28.45   1.52   0.17   430   117.75   6.5   2.4E-02   19   1.18E-01     Lonc   Gottos   2.6   685.86   0.679   28.72   28.45   1.52   0.17   430   117.75   6.5   2.4E-02   2.7   1.9E-02     Lonc   Gottos   2.6   685.86   0.679   28.72   34.54   1.52   0.17   430   117.75   6.5   2.4E-02   2.7   1.9E-02     Lonc   Gottos   2.6   685.86   0.679   28.72   3.454   1.52   0.17   430   117.75   6.5   2.7E-03   2.7   4.09E-02     Lond   Gottos   2.6   685.86   0.679   28.72   86.48   1.52   0.17   430   117.75   1.3   2.2E-03   2.9   2.2BE-02     Lond   Gottos   2.6   685.86   0.679   28.72   86.48   1.52   0.17   430   117.75   1.3   2.2E-03   2.9   2.2BE-02     Lond   Gottos   2.6   685.86   0.679   28.72   86.48   1.52   0.17   430   117.75   1.3   2.2E-03   2.9   2.2BE-02     Lond   Gottos   2.6   685.86   0.679   28.72   86.48   1.52   0.17   430   117.75   1.3   2.2E-03   2.9   2.2BE-02     Lond   Gottos   2.6   685.86   0.679   28.72   86.48   1.52   0.17   430   238.82   6.5   2.4E-02   2.7BE-03   2.2BE-02     Lond   Gottos   2.6   685.86   | Area & Wst. Vol   | 420888 | 2.6   | 12437.7  | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430    | 238.82  | 6.5      | 1.71E-01     |      | 1.79E-01     | 5    |
| 60705   2.6   686.86   0.679   58.72   86.48   1.52   0.46   102   93.79   6.5   3.32E-02   8   1.53E-01   | TCLP & xwell      | 60705  | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 102    | 93.79   | 6.5      | 2.59E-02     | 12   | 1.65E-01     | 9    |
| L. Vol         60705         2.6         12437.7         0.679         58.72         86.48         1.52         0.17         430         0.00         6.5         2.40E-02         14         1.48E-01           Conc         60705         2.6         685.86         0.679         220         324.01         1.52         0.17         430         0.00         6.5         3.44E-02         7         1.32E-01           Conc         60705         2.6         685.86         0.679         220         324.01         1.52         0.17         430         10.70         6.5         1.34E-02         7         1.32E-01           Conc         60705         2.6         685.86         0.679         220         324.01         1.52         0.17         430         10.70         6.5         1.3E-02         1.7         1.25         0.17         430         1.07         6.5         1.3E-01         1.1         1.1E-01         1.1         1.2E-01         1.1         1.2E-02         <  | Infil & Xwell     | 60705  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 102    | 93.79   |          | 3.32E-02     | 80   | 1.53E-01     | 7    |
| House   G0705   2.6   G95.86   0.679   58.72   B6.46   1.52   0.17   102   0.00   6.5   3.44E-02   7   1.32E-01     Conc   G0705   2.6   G85.86   0.679   220   224.01   1.52   0.46   430   117.75   6.5   1.44E-02   17   1.22E-01     Conc   G0705   2.6   G85.86   0.679   220   224.01   1.52   0.17   430   117.75   6.5   1.34E-02   17   1.22E-01     Conc   G0705   2.6   G85.86   0.679   58.72   34.54   1.52   0.17   430   0.00   6.5   2.38E-02   18   1.18E-01     Conc   G0705   2.6   G85.86   0.679   220   224.01   1.52   0.17   430   0.00   6.5   5.1E-02   18   1.12E-01     Mst. Conc   G0705   2.6   G85.86   0.679   220   224.01   1.52   0.17   430   0.00   6.5   5.1E-02   18   1.12E-01     Mst. Conc   G0705   2.6   G85.86   0.679   58.72   34.54   1.52   0.17   430   0.00   6.5   5.1E-02   2   1.12E-01     Mst. Conc   42088   2.6   G85.86   0.679   58.72   34.54   1.52   0.17   430   0.00   6.5   5.1E-02   2   7.19E-02     Mst. Conc   42088   2.6   G85.86   0.679   58.72   34.54   1.52   0.17   430   0.00   6.5   5.1E-02   2   7.19E-02     Mst. Conc   42088   2.6   G85.86   0.679   58.72   86.48   1.52   0.17   430   0.17.75   1.3   2.21E-03   2   3.3EE-02     Mst. Conc   42088   2.6   G85.86   0.679   58.72   86.48   1.52   0.17   430   0.00   1.3   1.02E-02   2   3.3EE-02     Mst. Conc   42088   2.6   G85.86   0.679   58.72   86.48   1.52   0.17   430   0.00   1.3   1.02E-02   2   3.3EE-02     Mst. Conc   42088   2.6   G85.86   0.679   58.72   86.48   1.52   0.17   430   0.00   1.3   1.02E-03   2   2.5EE-02     Mst. Conc   42088   2.6   G85.86   0.679   58.72   86.48   1.52   0.17   430   0.00   1.3   0.00   1.3   0.00   2   2.2E-03     Mst. Conc   42088   2.6   G85.86   0.679   58.72   86.48   1.52   0.17   430   0.00   1.3   0.00   2   2.2E-03   2   2.49E-02     Mst. Conc   42088   2.6   G85.86   0.679   58.72   86.48   1.52   0.17   430   0.00    | Ywell & Wst. Vol  | 60705  | 2.6   | 12437.7  | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430    | 0.00    | 6.5      | 2.40E-02     | 14   | 1.48E-01     | 80   |
| Conc         60705         2.6         685.86         0.679         220         324.01         1.52         0.46         430         117.75         6.5         1.44E-02         17         1.22E-01           Conc         60705         2.6         685.86         0.679         220         324.01         1.52         0.17         430         10.70         6.5         2.33E-02         15         1.18E-01           Conc         60705         2.6         685.86         1.7         220         129.41         1.52         0.17         430         10.70         6.5         2.33E-02         1.8         1.18E-01           Il         60705         2.6         685.86         1.7         220         129.41         1.52         0.17         430         10.75         6.5         1.18E-01         1.18E-01           Net         60705         2.6         685.86         1.7         28.72         38.40         1.52         0.17         430         10.75         6.5         5.1E-02         1.18E-01   | Ywell & Xwell     | 60705  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 102    | 0.00    | 6.5      | 3.44E-02     | 7    | 1.32E-01     | o    |
| Conc         60705         2.6         685.86         0.679         220         324.01         1.52         0.17         430         0.00         6.5         2.33E.02         15         1.10E-01           Conc         60705         2.6         685.86         1.7         220         129.41         1.52         0.17         430         117.75         6.5         1.34E.02         18         1.18E-01           Fond         6.0705         2.6         685.86         1.7         58.72         34.54         1.52         0.17         430         117.75         6.5         1.18E-02         18         1.18E-01           Net. Concl.         60705         2.6         685.86         1.7         58.72         34.54         1.52         0.17         430         0.00         6.5         5.11E-02         16         1.12E-01           Net. Concl.         60705         2.6         685.86         0.679         324.01         1.52         0.17         430         0.00         6.5         5.11E-02         16         1.12E-01           Net. Concl.         60705         2.6         685.86         0.679         324.01         1.52         0.17         430         0.00         6.5   | Infil & Wst. Conc | 60705  | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52     | 0.46   | 430    | 117.75  | 6.5      | 1.44E-02     | 17   | 1.22E-01     | 9    |
| Conc   60705   2.6   686.86   1.7   220   129.41   1.52   0.17   430   117.75   6.5   1.34E-02   18   1.18E-01   1.18E-01   1.18E-01   1.28E-01   1.28E- | Ywell & Wst Conc  | 60705  | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52     | 0.17   | 430    | 0.00    | 6.5      | 2.33E-02     | 15   | 1.18E-01     | =    |
| Harry   G0705   2.6   G85.86   0.679   58.72   86.48   1.52   0.17   102   93.79   1.3   1.64E-02   1.6   1.12E-01   1.12E-01   1.22E-02   2.6   685.86   1.7   58.72   34.54   1.52   0.17   430   0.00   6.5   5.1E-02   6   8.89E-02   2.4   1.2E-01   2.5   6.5    | TCLP & Wst Conc   | 60705  | 2.6   | 685.86   | 1.7    | 220      | 129.41  | 1.52     | 0.17   | 430    | 117.75  | 6.5      | 1.34E-02     | 18   | 1.18E-01     | 12   |
| P         60705         2.6         685.86         1.7         58.72         34.54         1.52         0.17         430         0.00         6.5         5.11E-02         6         8.89E-02           Nst. Conc         60705         2.6         12437.7         0.679         220         324.01         1.52         0.17         430         177.75         6.5         5.9EE-03         24         8.77E-02           Conc         42088         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         0.00         6.5         5.24E-02         4         7.6EE-02           Conc         42088         2.6         685.86         0.679         58.72         34.64         1.52         0.47         430         177.75         6.5         5.71E-02         7         7.99E-02           Mell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         177.75         6.5         271E-02         7         7.99E-02           Mell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         177.6 <td>Xwell &amp; Zwell</td> <td>60705</td> <td>2.6</td> <td>685.86</td> <td>0.679</td> <td>58.72</td> <td>86.48</td> <td>1.52</td> <td>0.17</td> <td>102</td> <td>93:79</td> <td>1.3</td> <td>1.64E-02</td> <td>16</td> <td>1.12E-01</td> <td>13</td>  | Xwell & Zwell     | 60705  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 102    | 93:79   | 1.3      | 1.64E-02     | 16   | 1.12E-01     | 13   |
| NAST. Conc         60705         2.6         12437.7         0.679         224.01         1.52         0.17         430         117.75         6.5         5.95E-03         24         877E-02           Conc         42088         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         0.00         6.5         5.24E-02         4         7.06E-02           Conc         42088         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         17.75         6.5         2.71E-02         7         7.06E-02           Axell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         17.75         6.5         2.71E-02         7         7.06E-02           Axell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         17.75         6.5         5.18E-02         2         7.19E-02           Axell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         0.00 <td< td=""><td>Ywell &amp; TCLP</td><td>60705</td><td>2.6</td><td>685.86</td><td>1.7</td><td>58.72</td><td>34.54</td><td>1.52</td><td>0.17</td><td>430</td><td>0.00</td><td>6.5</td><td>5.11E-02</td><td>မ</td><td>8.89E-02</td><td>14</td></td<>  | Ywell & TCLP      | 60705  | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 430    | 0.00    | 6.5      | 5.11E-02     | မ    | 8.89E-02     | 14   |
| Conc         42088         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         0.00         6.5         5.24E-02         4         7.66E-02           Conc         420888         2.6         685.86         1.7         58.72         34.61         1.52         0.17         430         238.82         6.5         8.02E-02         2         7.19E-02           Awell         60705         2.6         685.86         1.7         58.72         86.48         1.52         0.17         430         117.75         6.5         2.71E-02         1         6.09E-02           Awell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         117.75         6.5         5.18E-02         7         7.99E-02           Awell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         17.75         1.3         2.21E-02         2         7.19E-02           Awell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         17.75<  |                   | _      | 2.6   | 12437.7  | 0.679  | 220      | 324.01  | 1.52     | 0.17   | 430    | 117.75  | 6.5      | 5.95E-03     | 24   | 8.77E-02     | 15   |
| Conc         42088         2.6         685.86         0.679         220         324.01         1.52         0.17         430         238.82         6.5         8.02E-02         2         7.19E-02           Zwell         60705         2.6         685.86         1.7         58.72         34.54         1.52         0.46         430         117.75         6.5         2.71E-02         11         6.09E-02           Zwell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         117.75         1.3         2.31E-03         27         4.09E-02           II         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         117.75         1.3         2.21E-03         27         4.09E-02           Zwell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         117.75         1.3         2.21E-03         28         3.56E-02           Zwell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         1  | Ywell & Infil     | 60705  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 430    | 0.00    | 6.5      | 5.24E-02     | 4    | 7.66E-02     | 16   |
| Xwell         60705         2.6         685.86         1.7         58.72         34.54         1.52         0.46         430         117.75         6.5         2.71E-02         11         6.09E-02           Xwell         60705         2.6         12437.7         0.679         58.72         86.48         1.52         0.17         430         117.75         1.3         2.31E-03         27         4.09E-02           II         42088         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         117.75         1.3         2.21E-03         23         3.35E-02           Zwell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         17.75         1.3         2.21E-03         23         3.35E-02           Zwell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         117.75         1.3         4.91E-03         25         2.9E-03           II         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         2.  | Area & Wst. Conc  | 420888 | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52     | 0.17   | 430    | 238.82  | 6.5      | 8.02E-02     | 2    | 7.19E-02     | 17   |
| Zwell         60705         2.6         12437.7         0.679         58.72         86.48         1.52         0.17         430         117.75         1.3         2.31E-03         27         4.09E-02           II         420888         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         6.06         5.18E-02         5         3.89E-02           II         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         17.75         1.3         2.22E-03         23         3.36E-02           Zwell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         117.75         1.3         2.22E-03         23         3.36E-02           II         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         117.75         1.3         4.91E-03         25         2.86E-02           II         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         236.82         6.5<  | Infil & TCLP      | 60705  | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52     | 0.46   | 430    | 117.75  | 6.5      | 2.71E-02     | =    | 6.09E-02     | 8    |
| 420888         2.6         685.86         0.679         58.72         86.48         1.52         0.17         402         217.62         6.5         5.18E-02         5         3.89E-02           Mell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         17.75         1.3         2.22E-03         23         3.35E-02           Mell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.47         430         17.75         1.3         5.24E-03         23         3.35E-02           Mell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         17.75         1.3         5.24E-03         25         2.58E-02           Mell         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         6.0         3.00E-02         9         2.27E-02           Mell         4.2088         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         238.82         6.5         2.4  | Wst. Vol & Zwell  | 60705  | 2.6   | 12437.7  | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430    | 117.75  | 1.3      | 2.31E-03     | 27   | 4.09E-02     | 19   |
|  | Area & Xwell      | 420888 | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 102    | 217.62  | 6.5      | 5.18E-02     | 5    | 3.89E-02     | 22   |
| Zwell         60705         2.6         685.86         0.679         224.01         1.52         0.17         430         117.75         1.3         2.22E-03         28         3.26E-02           II         60705         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         117.75         1.3         5.24E-03         28         2.58E-02           II         42088         2.6         685.86         0.679         58.72         34.54         1.52         0.17         430         117.75         1.3         4.91E-03         26         2.49E-02           3         42088         2.6         685.86         0.679         58.72         34.54         1.52         0.17         430         58.82         6.5         2.38E-02         9         2.27E-02           42088         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         238.82         6.5         2.44E-02         13         1.77E-02           42088         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         238.82         6.5         2.44E-02         13  | Ywell & Zweli     | 60705  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430    | 0.00    | 1.3      | 1.02E-02     | 23   | 3.35E-02     | 21   |
| 60705         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         17.75         1.3         5.24E-03         25         2.58E-02           1         420888         2.6         685.86         1.7         58.72         34.54         1.52         0.17         430         117.75         1.3         4.91E-03         26         2.49E-02           1         420888         2.6         685.86         0.679         58.72         34.54         1.52         0.17         430         6.5         3.00E-02         9         2.27E-02           2         420888         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         238.82         6.5         2.44E-02         10         2.23E-02           42088         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         238.82         6.5         2.44E-02         13         1.77E-02           42088         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         238.82         1.3         1.77E-02         13         1.34E-02  | Wst Conc & Zwell  | 60705  | 2.6   | 685.86   | 0.679  | 220      | 324.01  | 1.52     | 0.17   | 430    | 117.75  | 1.3      | 2.22E-03     | 82   | 3.26E-02     | 22   |
| 60705   2.6   685.86   1.7   58.72   34.54   1.52   0.17   430   117.75   1.3   4.91E-03   26   2.49E-02   2   420888   2.6   685.86   0.679   58.72   86.48   1.52   0.17   430   0.00   6.5   3.00E-02   9   2.27E-02   2   420888   2.6   685.86   0.679   58.72   86.48   1.52   0.46   430   238.82   6.5   2.44E-02   13   1.77E-02   3   4.20888   2.6   685.86   0.679   58.72   86.48   1.52   0.17   430   238.82   1.3   1.17E-02   21   1.34E-02   3   4.34E-02   3   4.3 | Infil & Zwell     | 60705  | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   | 430    | 117.75  | 1.3      | · 5.24E-03   | 25   | 2.58E-02     | 23   |
| 420888         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         6.6         5.30E-02         9         2.27E-02           420888         2.6         685.86         0.679         58.72         34.54         1.52         0.17         430         238.82         6.5         2.85E-02         10         2.23E-02           420888         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         238.82         6.5         2.44E-02         13         1.77E-02           420888         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         238.82         1.3         1.77E-02         21         1.34E-02  | TCLP & Zwell      | 60705  | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 430    | 117.75  | 1.3      | 4.91E-03     | 92   | 2.49E-02     | 24   |
| 420888         2.6         685.86         1.7         58.72         34.54         1.52         0.17         430         238.82         6.5         2.85E-02         10         2.23E-02           420888         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         238.82         6.5         2.44E-02         13         1.77E-02           420888         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         238.82         1.3         1.77E-02         21         1.34E-02  | Area & Ywell      | 420888 | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | 430    | 0.00    | 6.5      | 3.00E-02     | တ    | 2.27E-02     | 25   |
| 420888         2.6         685.86         0.679         58.72         86.48         1.52         0.46         430         238.82         6.5         2.44E-02         13         1.77E-02           420888         2.6         685.86         0.679         58.72         86.48         1.52         0.17         430         238.82         1.3         1.17E-02         21         1.34E-02  |                   | 420888 | 2.6   | 685.86   | 1.7    | 58.72    | 34.54   | 1.52     | 0.17   | 430    | 238.82  | 6.5      | 2.85E-02     | 9    | 2.23E-02     | 56   |
| 420888 2.6 685.86 0.679 58.72 86.48 1.52 0.17 430 238.82 1.3 1.17E-02 21 1.34E-02  |                   | 420888 | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.46   |        | 238.82  | 6.5      | 2.44E-02     | 13   | 1.77E-02     | 27   |
|  |                   | 420888 | 2.6   | 685.86   | 0.679  | 58.72    | 86.48   | 1.52     | 0.17   | Н      | 238.82  | 1.3      | 1.17E-02     | 21   | 1.34E-02     | 28   |

Table A.40 Sensitivity Analysis for Crude Oil tank sediment Off-Site Landfill /TC Capped Benzene -- Municipal Areas, 30 Year Active Life

| Cw / Cl         Wst. Den         Infile A-well         Y-Well (m)         Y-Well (m)         Y-Well (m)         Y-Well (m)         Y-Well (m)         Y-Well (m)         Pyear Avg.         S-year Avg.         S-ye |                                   | <del>- , .</del> | _      |          |       |          |             |          |        |        |          |        | 1997         |      | 1998        | Γ    |
|--|-----------------------------------|------------------|--------|----------|-------|----------|-------------|----------|--------|--------|----------|--------|--------------|------|-------------|------|
| (g/cm3) (m/yr)         (m)         (m)         (m)         Conc. (mg/L)         Rank         Conc. (mg/L)           1.52         0.17         430         17.75         6.5         3.94E-03         18         3.30E-02           1.52         0.17         102         93.79         6.5         9.07E-03         18         1.86E-01           1.52         0.17         102         93.79         6.5         8.65E-03         19         1.57E-01           1.52         0.17         430         238.82         6.5         1.06E-02         16         1.45E-01           1.52         0.46         430         117.75         6.5         1.06E-02         1         1.45E-01           1.52         0.46         430         117.75         6.5         1.6E-02         1         1.45E-01           1.52         0.46         430         117.75         6.5         1.07E-02         1         1.14E-01           1.52         0.46         430         117.75         6.5         1.07E-02         15         1.14E-01           1.52         0.46         430         117.75         6.5         1.74E-02         1         1.14E-01           1.52         0.46  | <u> </u>                          | TCLP             | TCLP   |          | WSC   | ouc      | ਹ<br>}<br>ਠ | Wst. Den |        | X-well | Y. Well  | Z-Well | 9-year Avg.  |      | 9-year Avg. |      |
| 1.52         0.17         430         117.75         6.5         3.94E-03         3.30E-02           1.52         0.17         102         93.79         6.5         9.07E-03         18         1.86E-01           1.52         0.17         102         93.79         6.5         9.07E-03         19         1.57E-01           1.52         0.17         430         238.82         6.5         1.34E-01         1         1.47E-01           1.52         0.46         430         117.75         6.5         1.06E-02         16         1.45E-01           1.52         0.46         430         0.00         6.5         2.67E-02         7         1.14E-01           1.52         0.46         430         117.75         6.5         1.07E-02         15         1.14E-01           1.52         0.46         430         0.00         6.5         2.67E-02         7         1.13E-01           1.52         0.46         430         0.00         6.5         1.74E-02         1         1.01E-01           1.52         0.46         430         0.00         6.5         4.04E-02         1         1.01E-01           1.52         0.47         430<   | Œ                                 | (m3) (mg/L)      | (mg/L) |          | (mg/k | <b>a</b> | (L/kg)      |          | (m/yr) | Œ      | <u>E</u> | Œ      | Conc. (mg/L) | Rank |             | Rank |
| 1.52         0.17         102         93.79         6.5         9.07E-03         18         1.86E-01           1.52         0.17         102         93.79         6.5         8.65E-03         19         1.57E-01           1.52         0.17         430         238.82         6.5         1.34E-01         1         1.47E-01           1.52         0.46         430         117.75         6.5         1.06E-02         16         1.45E-01           1.52         0.46         430         117.75         6.5         1.81E-02         1         1.14E-01           1.52         0.17         430         0.00         6.5         1.81E-02         1         1.14E-01           1.52         0.17         430         0.00         6.5         1.74E-02         1         1.15E-01           1.52         0.17         430         0.00         6.5         1.74E-02         1         1.15E-02           1.52         0.17         430         0.00         6.5         4.04E-02         1         1.01E-01           1.52         0.17         430         238.82         6.5         7.14E-02         1         7.07E-02           1.52         0.17 <td>2.6</td> <td>685.9 0.5</td> <td>0.5</td> <td></td> <td>58.7</td> <td>~</td> <td>117.44</td> <td>1.52</td> <td>0.17</td> <td>430</td> <td>117.75</td> <td>6.5</td> <td>3.94E-03</td> <td></td> <td>3.30E-02</td> <td></td>   | 2.6                               | 685.9 0.5        | 0.5    |          | 58.7  | ~        | 117.44      | 1.52     | 0.17   | 430    | 117.75   | 6.5    | 3.94E-03     |      | 3.30E-02    |      |
| 1.52         0.17         102         93.79         6.5         8.65E-03         19         1.57E-01           1.52         0.17         430         238.82         6.5         1.34E-01         1         1.47E-01           1.52         0.46         430         117.75         6.5         1.06E-02         16         1.45E-01           1.52         0.46         430         117.75         6.5         2.56E-02         8         1.39E-01           1.52         0.46         430         0.00         6.5         1.81E-02         10         1.14E-01           1.52         0.46         430         117.75         6.5         1.07E-02         17         1.13E-01           1.52         0.46         430         117.75         6.5         1.74E-02         17         1.15E-02           1.52         0.46         430         0.00         6.5         1.74E-02         17         0.0E-0E-02           1.52         0.46         430         0.00         6.5         4.04E-02         7         1.13E-02           1.52         0.17         430         0.00         6.5         4.04E-02         1         7.07E-02           1.52         0.   | 2.6                               | 12437.7 0.5      | 0.5    |          | 58.7. | ~        | 117.44      | 1.52     | 0.17   | 102    | 93.79    | 6.5    | 9.07E-03     | 18   | 1.86E-01    | -    |
| 1.52         0.17         430         238.82         6.5         1.34E-01         1         1.47E-01           1.52         0.46         430         117.75         6.5         1.06E-02         16         1.45E-01           1.52         0.46         430         117.75         6.5         2.56E-02         8         1.39E-01           1.52         0.47         430         0.00         6.5         2.67E-02         7         1.18E-01           1.52         0.17         430         117.75         6.5         1.07E-02         1.3         1.18E-01           1.52         0.17         430         117.75         6.5         1.74E-02         1.3         9.55E-02           1.52         0.17         430         0.00         6.5         4.04E-02         1.1         9.35E-02           1.52         0.17         430         0.00         6.5         4.04E-02         2         6.65E-02           1.52         0.17         430         117.75         6.5         4.04E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-02         2         6.65E-02           1.52  | 2.6 685.9 0.5                     | 685.9 0.5        | 0.5    |          | 220   |          | 440.00      | 1.52     | 0.17   | 102    | 93.79    | 6.5    | 8.65E-03     | 19   | 1.57E-01    | 2    |
| 1.52         0.46         430         117.75         6.5         1.06E-02         16         1.45E-01           1.52         0.46         430         10.70         6.5         2.56E-02         8         1.39E-01           1.52         0.46         102         93.79         6.5         2.56E-02         8         1.39E-01           1.52         0.17         430         0.00         6.5         2.67E-02         7         1.13E-01           1.52         0.17         102         93.79         1.3         1.27E-02         13         9.55E-02           1.52         0.17         430         0.00         6.5         1.74E-02         13         9.55E-02           1.52         0.17         430         0.00         6.5         1.74E-02         17         0.55E-02           1.52         0.17         430         0.00         6.5         4.04E-02         3         3.83E-02           1.52         0.17         430         117.75         6.5         4.41E-03         2         6.65E-02           1.52         0.17         430         117.75         1.3         1.74E-03         2         6.46E-02           1.52         0.17 <td>2.6 12437.7 0.5</td> <td>12437.7 0.5</td> <td>0.5</td> <td>-</td> <td>58.7</td> <td>2</td> <td>117.44</td> <td>1.52</td> <td>0.17</td> <td>430</td> <td>238.82</td> <td>6.5</td> <td>1.34E-01</td> <td>1</td> <td>1.47E-01</td> <td>6</td>                                  | 2.6 12437.7 0.5                   | 12437.7 0.5      | 0.5    | -        | 58.7  | 2        | 117.44      | 1.52     | 0.17   | 430    | 238.82   | 6.5    | 1.34E-01     | 1    | 1.47E-01    | 6    |
| 1.52         0.46         102         93.79         6.5         2.56E-02         8         1.39E-01           1.52         0.17         430         0.00         6.5         1.81E-02         10         1.14E-01           1.52         0.17         430         0.00         6.5         1.07E-02         15         1.13E-01           1.52         0.46         430         117.75         6.5         1.07E-02         13         9.55E-02           1.52         0.17         430         0.00         6.5         1.74E-02         11         9.35E-02           1.52         0.17         430         0.00         6.5         4.04E-02         4         7.07E-02           1.52         0.17         430         0.00         6.5         4.04E-02         4         7.07E-02           1.52         0.17         430         17.75         6.5         4.41E-03         2         6.65E-02           1.52         0.17         430         117.75         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         2         5.95E-02           1.52         0.17  | 2.6 12437.7 0.5                   | 12437.7 0.5      | 0.5    | $\dashv$ | 58.7  | 2        | 117.44      | 1.52     | 0.46   | 430    | 117.75   |        | 1.06E-02     | 16   | 1.45E-01    | 4    |
| 1.52         0.17         430         0.00         6.5         1.81E-02         10         1.14E-01           1.52         0.17         102         0.00         6.5         2.67E-02         7         1.13E-01           1.52         0.46         430         117.75         6.5         1.07E-02         13         9.55E-02           1.52         0.17         430         0.00         6.5         1.74E-02         11         9.35E-02           1.52         0.17         430         0.00         6.5         4.04E-02         4         7.07E-02           1.52         0.17         430         238.82         6.5         4.04E-02         4         7.07E-02           1.52         0.17         430         217.62         6.5         4.41E-03         2         6.46E-02           1.52         0.17         430         117.75         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         26         3.15E-02           1.52         0.17         430         117.75         1.3         4.04E-03         27         2.91E-02           1.52         0.46   | 2.6 685.9 0.5                     | 685.9 0.5        | 0.5    | $\dashv$ | 58.7. |          | 117.44      | 1.52     | 0.46   | 102    | 93.79    | 6.5    | 2.56E-02     | 89   | 1.39E-01    | 5    |
| 1.52         0.17         102         0.00         6.5         2.67E-02         7         1.13E-01           1.52         0.46         430         117.75         6.5         1.07E-02         15         1.01E-01           1.52         0.17         430         117.75         6.5         1.77E-02         13         9.55E-02           1.52         0.17         430         0.00         6.5         1.74E-02         1         9.35E-02           1.52         0.17         430         238.82         6.5         4.04E-02         2         6.65E-02           1.52         0.17         430         117.75         6.5         4.41E-03         22         6.65E-02           1.52         0.17         430         117.75         6.5         4.41E-03         22         6.46E-02           1.52         0.17         430         117.75         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         21         2.91E-02           1.52         0.17         430         117.75         1.3         4.04E-03         21         2.91E-02           1.52 <td< td=""><td>2.6 12437.7 0.5</td><td>12437.7 0.5</td><td>0.5</td><td></td><td>58.7</td><td>~</td><td>117.44</td><td>1.52</td><td>0.17</td><td>430</td><td>0.00</td><td>6.5</td><td>1.81E-02</td><td>10</td><td>1.14E-01</td><td>ဖ</td></td<>                                      | 2.6 12437.7 0.5                   | 12437.7 0.5      | 0.5    |          | 58.7  | ~        | 117.44      | 1.52     | 0.17   | 430    | 0.00     | 6.5    | 1.81E-02     | 10   | 1.14E-01    | ဖ    |
| 1.52         0.46         430         117.75         6.5         1.07E-02         15         1.01E-01           1.52         0.17         102         93.79         1.3         1.27E-02         13         9.55E-02           1.52         0.17         430         0.00         6.5         1.74E-02         11         9.35E-02           1.52         0.17         430         0.00         6.5         4.04E-02         2         6.65E-02           1.52         0.17         430         117.75         6.5         4.41E-03         2         6.65E-02           1.52         0.17         430         117.75         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         21         2.91E-02           1.52         0.17         430         117.75         1.3         1.6F-03         21         2.91E-02           1.52         0.17         430         117.75         1.3         4.04E-03         27         2.91E-02           1.52         0.46         430         117.75         1.3         4.04E-03         24         2.34E-02           1.52  | 2.6 685.9                         | 685.9 0.5        | 0.5    | -        | 58.7. |          | 117.44      | 1.52     | 0.17   | 102    | 0.00     | 6.5    | 2.67E-02     | 7    | 1.13E-01    | ~    |
| 1.52         0.17         102         93.79         1.3         1.27E-02         13         9.55E-02           1.52         0.17         430         0.00         6.5         1.74E-02         11         9.35E-02           1.52         0.17         430         0.00         6.5         4.04E-02         4         7.07E-02           1.52         0.17         430         117.75         6.5         4.41E-03         2         6.65E-02           1.52         0.17         430         117.75         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         26         3.15E-02           1.52         0.17         430         117.75         1.3         7.81E-03         27         2.91E-02           1.52         0.17         430         117.75         1.3         4.04E-03         27         2.99E-02           1.52         0.46         430         117.75         1.3         4.04E-03         27         2.99E-02           1.52         0.46         430         10.00         6.5         2.91E-03         5         2.24E-02           1.52         0   | 2.6                               | 685.9 0.5        | 0.5    | - 1      | 220   |          | 440.00      | 1.52     | 0.46   | 430    | 117.75   | 6.5    | 1.07E-02     | 15   | 1.01E-01    | 8    |
| 1.52         0.17         430         0.00         6.5         1.74E-02         11         9.35E-02           1.52         0.46         430         0.00         6.5         4.04E-02         4         7.07E-02           1.52         0.17         430         238.82         6.5         7.14E-03         2         6.65E-02           1.52         0.17         430         117.75         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         26         3.15E-02           1.52         0.17         430         117.75         1.3         7.81E-03         27         2.91E-02           1.52         0.17         430         117.75         1.3         4.04E-03         27         2.59E-02           1.52         0.17         430         117.75         1.3         4.04E-03         27         2.59E-02           1.52         0.46         430         117.75         1.3         4.04E-03         2         2.24E-02           1.52         0.46         430         10.00         6.5         2.92E-02         5         2.24E-02           1.52         0   | 2.6                               | 685.9 0.5        | 0.5    |          | 58.7  |          | 117.44      | 1.52     | 0.17   | 102    | 93.79    | 1.3    | 1.27E-02     | 13   | 9.55E-02    | 6    |
| 1.52         0.46         430         0.00         6.5         4.04E-02         4         7.07E-02           1.52         0.17         430         238.82         6.5         7.14E-02         2         6.65E-02           1.52         0.17         430         117.75         6.5         4.41E-03         22         6.46E-02           1.52         0.17         430         117.75         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         26         3.15E-02           1.52         0.17         430         117.75         1.3         1.67E-03         27         2.59E-02           1.52         0.17         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.17         430         0.00         6.5         2.92E-02         5         2.24E-02           1.52         0.46         430         17.75         1.3         4.04E-03         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.   | 2.6 685.9 0.5                     | 685.9 0.5        | 0.5    | $\dashv$ | 220   |          | 440.00      | _        | 0.17   | 430    | 0.00     | 6.5    | 1.74E-02     | 11   | 9.35E-02    | 5    |
| 1.52         0.17         430         238.82         6.5         7.14E-02         2         6.5E-02           1.52         0.17         430         117.75         6.5         4.41E-03         22         6.46E-02           1.52         0.17         430         117.75         1.3         1.74E-03         26         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         21         2.91E-02           1.52         0.17         430         117.75         1.3         4.04E-03         27         2.59E-02           1.52         0.46         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.46         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.46         430         17.75         1.3         4.04E-03         5         2.24E-02           1.52         0.46         430         17.75         1.3         4.04E-03         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52 <t< td=""><td>2.6</td><td>685.9 0.5</td><td>0.5</td><td><math>\dashv</math></td><td>58.72</td><td></td><td>117.44</td><td></td><td>0.46</td><td>430</td><td>0.00</td><td>6.5</td><td>4.04E-02</td><td>4</td><td>7.07E-02</td><td>=</td></t<>                                       | 2.6                               | 685.9 0.5        | 0.5    | $\dashv$ | 58.72 |          | 117.44      |          | 0.46   | 430    | 0.00     | 6.5    | 4.04E-02     | 4    | 7.07E-02    | =    |
| 1.52         0.17         430         117.75         6.5         4.41E-03         22         6.46E-02           1.52         0.17         102         217.62         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         26         3.15E-02           1.52         0.17         430         117.75         1.3         7.81E-03         27         2.91E-02           1.52         0.17         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.46         430         117.75         1.3         4.04E-03         5         2.24E-02           1.52         0.46         430         0.00         6.5         2.92E-02         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.17         430         238.82         1.3         1.14E-02         14         1.32E-02   | 2.6 685.9 0.5                     | 685.9 0.5        | 0.5    |          | 220   |          | 440.00      |          | 0.17   | 430    | 238.82   | 6.5    | 7.14E-02     | 2    | 6.65E-02    | 12   |
| 1.52         0.17         102         217.62         6.5         4.94E-02         3         3.83E-02           1.52         0.17         430         117.75         1.3         1.74E-03         26         3.15E-02           1.52         0.17         430         0.00         1.3         7.81E-03         27         2.91E-02           1.52         0.17         430         117.75         1.3         4.04E-03         27         2.59E-02           1.52         0.17         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.46         430         0.00         6.5         2.92E-02         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.46         430         238.82         1.3         1.14E-02         14         1.32E-02   | 2.6 12437.7                       | 12437.7 0.5      | 0.5    |          | 220   |          | 440.00      |          | 0.17   | 430    | 117.75   | 6.5    | 4.41E-03     | 22   | 6.46E-02    | 13   |
| 1.52         0.17         430         117.75         1.3         1.74E-03         26         3.15E-02           1.52         0.17         430         0.00         1.3         7.81E-03         21         2.91E-02           1.52         0.17         430         117.75         1.3         1.67E-03         27         2.59E-02           1.52         0.46         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.17         430         0.00         6.5         2.92E-02         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.17         430         238.82         1.3         1.14E-02         14         1.32E-02  | 2.6 685.9                         | 685.9 0.5        | 0.5    | -        | 58.72 |          | 117.44      |          | 0.17   | 102    | 217.62   | 6.5    | 4.94E-02     | 3    | 3.83E-02    | 14   |
| 1.52         0.17         430         0.00         1.3         7.81E-03         21         2.91E-02           1.52         0.17         430         117.75         1.3         1.67E-03         27         2.59E-02           1.52         0.46         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.17         430         0.00         6.5         2.92E-02         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.17         430         238.82         1.3         1.14E-02         14         1.32E-02  | 2.6 12437.7 0.5                   | 12437.7 0.5      | 0.5    | _        | 58.7  | 2        | 117.44      |          | 0.17   | 430    | 117.75   | 1.3    | 1.74E-03     | 26   | 3.15E-02    | 15   |
| 1.52         0.17         430         117.75         1.3         1.67E-03         27         2.59E-02           1.52         0.46         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.17         430         0.00         6.5         2.92E-02         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.17         430         238.82         1.3         1.14E-02         14         1.32E-02  | 2.6 685.9                         | 685.9 0.5        | 0.5    | $\dashv$ | 58.7  | ~        | 117.44      |          | 0.17   | 430    | 0.00     | 1.3    | 7.81E-03     | 21   | 2.91E-02    | 16   |
| 1.52         0.46         430         117.75         1.3         4.04E-03         24         2.38E-02           1.52         0.17         430         0.00         6.5         2.92E-02         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.17         430         238.82         1.3         1.14E-02         14         1.32E-02  | 2.6                               | 685.9 0.5        | 0.5    |          | 220   |          | 440.00      |          | 0.17   | 430    | 117.75   | 1.3    | 1.67E-03     | 27   | 2.59E-02    | 17   |
| 1.52         0.17         430         0.00         6.5         2.92E-02         5         2.24E-02           1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.17         430         238.82         1.3         1.14E-02         14         1.32E-02  | 5.6                               | 685.9 0.5        | 0.5    |          | 58.7. | ~        | 117.44      |          | 0.46   | 430    | 117.75   | 1.3    | 4.04E-03     | 24   | 2.38E-02    | 18   |
| 1.52         0.46         430         238.82         6.5         2.41E-02         9         1.76E-02           1.52         0.17         430         238.82         1.3         1.14E-02         14         1.32E-02   | 2.6                               | 685.9 0.5        | 0.5    |          | 58.7  | 2        | 117.44      |          | 0.17   | 430    | 0.00     | 6.5    | 2.92E-02     | 5    | 2.24E-02    | 19   |
| 1.52 0.17 430 238.82 1.3 1.14E-02 14 1.32E-02  | 2.6 685.9 0.5                     | 685.9 0.5        | 0.5    |          | 58.7  | 7        | 117.44      | -        | 0.46   | -      | 238.82   | 6.5    | 2.41E-02     | 6    | 1.76E-02    | 20   |
|  | <b>420888</b> 2.6 685.9 0.5 58.72 | 685.9 0.5        | 0.5    | $\dashv$ | 58.72 |          | 117.44      |          | 0.17   |        | 238.82   | 1.3    | 1.14E-02     | 14   | 1.32E-02    | 21   |

Table A.41 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene -- Industrial Areas, 30 Year Active Life

| Two Parameters       | Area   | De of | Wet    | . E      | -              |                         |         |                 |        |         |                 | 1997        |       | 1998         |      |
|----------------------|--------|-------|--------|----------|----------------|-------------------------|---------|-----------------|--------|---------|-----------------|-------------|-------|--------------|------|
| at High End          | (m2)   | Ξ     |        | (mg/L)   | (mg/kg) (L/kg) | ( <u>r</u> kg) <u>c</u> | (g/cm3) | infil<br>(m/yr) | X-well | Y- Well | Z-Well          | 9-year Avg. | Dank  | 9-year Avg.  | 1997 |
| Base Case            | 20200  | 5.6   | 714    | 7.9      | 116.38         | 14.73                   | 0.84    | 0.17            | 65     | 85 91   | 6.5             | 3 06E 00    | Nallk | Conc. (mg/L) | Kank |
| Wst. Conc. & X-Well  | 20200  | 2.6   | 714    | 7.9      | 200            | 63.29                   | 0.84    | 0 17            | 103    | 60.76   | 0.0             | 3.90E-02    | ,     | 7.19E-02     |      |
| Wst. Vol & X-Well    | 20200  | 2.6   | 2763.9 | 7.9      | 116.38         | 14.73                   | 0.84    | 0 17            | 3      | 80.76   | 0.0             | 1.215-01    | 2     | 7.41E-01     | -    |
| Wst. Conc. & Y- Well | 20200  | 2.6   | 714    | 7.9      | 200            | 63 29                   | 0.84    | 0 17            | 430    | 2 2     | 0.0             | 1.215-01    | ۵ .   | 7.05E-01     | 2    |
| Wst. Vol & Y- Well   | 20200  | 2.6   | 2763.9 | 7.9      | 116 38         | 14 73                   | 280     | 2 42            | 3 5    | 300     | 0.0             | 2.39E-01    | 4     | 5.70E-01     | က    |
| X-Well & Infil       | 20200  | 2.6   | 714    | 7.9      | 116 38         | 17.73                   | 5 6     | 3 6             | 55     | 0.00    | 6.5             | 2.37E-01    | 2     | 5.40E-01     | 4    |
| X-Well & Y- Well     | 20200  | 2.6   | 714    | 7.0      | 116.30         | 5 2 2                   | 0.0     | 9 5             | 702    | 60.76   | 6.5             | 2.02E-01    | 9     | 4.12E-01     | 2    |
| X-Well & Z-Well      | 20200  | 26    | 714    | 20,      | 116.30         | 7 73                    | 5 6     | 7 .             | 20     | 0.00    | 6.5             | 2.79E-01    | 3     | 4.06E-01     | 9    |
| Wst. Conc & Infil    | 20200  | 26    | 747    | 2 6      | 00.00          | 14.73                   | 0.84    | )<br> -<br> -   | 102    | 92.09   | <del>1</del> .3 | 1.33E-01    | 12    | 3.43E-01     | 7    |
| X-Well & TCI P       | 20202  | 2.0   | 744    | S. 6     | 200            | 63.29                   | 0.84    | 0.46            | 89     | 85.91   | 6.5             | 1.31E-01    | 13    | 3.20E-01     | 80   |
| Wst. Vol & Wst Conc  | 20202  | 2.0   | 9769.0 | 200      | 10.38          | 2.98                    | 0.84    | 0.17            | 102    | 92.09   | 6.5             | 1.83E-01    | 80    | 3.16E-01     | 6    |
| Wst Conc & TCI P     | 20200  | 2 6   | 244    | P. 6     | 000            | 63.29                   | 0.84    | 0.17            | 430    | 85.91   | 6.5             | 5.97E-02    | 20    | 3.14E-01     | 9    |
| Wet Vol & Infi       | 20200  | 2 6   | 41/0   | 80       | 000            | 12.82                   | 0.84    | 0.17            | 430    | 85.91   | 6.5             | 1.84E-01    | 7     | 3.14E-01     | =    |
| Wet Vol & TOI D      | 20200  | 6.0   | 2/63.9 | 6./      | 116.38         | 14.73                   | 0.84    | 0.46            | 430    | 85.91   | 6.5             | 1.28E-01    | 14    | 2.98E-01     | 12   |
| Valvell 9 TOLD       | 20200  | 9.7   | 2763.9 | 39       | 116.38         | 2.98                    | 0.84    | 0.17            | 430    | 85.91   | 6.5             | 1.76E-01    | 6     | 2.85E-01     | 13   |
| V Well & Left        | 20200  | 9.7   | /14    | 39       | 116.38         | 2.98                    | 0.84    | 0.17            | 430    | 0.00    | 6.5             | 3.38E-01    | -     | 2.24E-01     | 14   |
|                      | 20200  | 5.6   | 714    | 7.9      |                | 14.73                   | 0.84    | 0.46            | 430    | 0.00    | 6.5             | 3.00E-01    | 2     | 2.15E-01     | 5    |
| œ l                  | 162000 | 5.6   | 714    | 7.9      |                | 63.29                   | 0.84    | 0.17            | 430    | 165.01  | 6.5             | 1.63E-01    | 2     | 1.97E-01     | 16   |
| ea                   | 162000 | 2.6   | 2763.9 | 7.9      | 116.38         | 14.73                   | 0.84    | 0.17            | 430    | 165.01  | 6.5             | 1.47E-01    | =     | 1.78E-01     | 12   |
|                      | 162000 | 5.6   | 714    | 7.9      | $\vdash$       | 14.73                   | 0.84    | 0.17            | 102    | 142.35  | 6.5             | 7.27E-02    | 19    | 1.11E-01     | - 18 |
| I -vveil & Z-vveil   | 20200  | 5.6   | 714    | 7.9      | 116.38         | 14.73                   | 0.84    | 0.17            | 430    | 0.00    | 1.3             | 7.96E-02    | 18    | 1.03E-01     | 6    |
| x Z-Well             | 20200  | 5.6   | 714    | 7.9      |                | 63.29                   | 0.84    | 0.17            | 430    | 85.91   | 1.3             | 2.30E-02    | 92    | 9.56E-02     | 2 2  |
|                      | 20200  | 5.6   | 714    | 33       | -              | 2.98                    | 0.84    | 0.46            | 430    | 85.91   | 6.5             | 1.05E-01    | 12    | 9.24E-02     | 3 2  |
| Veil                 | 20200  | 5.6   | 2763.9 | 7.9      |                | 14.73                   | 0.84    | 0.17            | 430    | 85.91   | 1.3             | 2.28E-02    | 27    | +            | 22   |
| I -well & Alea       | 162000 | 5.6   | 714    | 7.9      | -              | 14.73                   | 0.84    | 0.17            | 430    | 0.00    | 6.5             | 4.17E-02    | 21    | +            | 33   |
|                      | 162000 | 2.6   | 714    | $\dashv$ | -              | 2.98                    | 0.84    | 0.17            | 430    | 165.01  | 6.5             | 3.84E-02    | 22    | +            | 77   |
|                      | 162000 | 5.6   | 714    |          | -              | 14.73                   | 0.84    | 0.46            | 430    | 165.01  | 6.5             | 3.30E-02    | 23    | +            | 25   |
|                      | 20200  | 5.6   | 714    |          |                | 14.73                   | 0.84 0  | 0.46            | 430    | 85.91   | 1.3             | 3.00E-02    | 52    | ╁            | 28   |
|                      | 20200  | 5.6   | 714    | -        | $\dashv$       | 2.98                    | 0.84 0  | 0.17            | 430    | 85.91   | 1.3             | 3.24E-02    | 24    | 3.77E-02     | 27   |
| עובמ מ ל-עיפון       | 162000 | 5.6   | 714    | 7.9      | 116.38         | 14.73                   | 0.84 0  | 0.17            | 430 1  | 165.01  | 1.3             | 1.64E-02    | 28    | +            | 28   |
|                      |        |       |        |          |                |                         |         |                 |        |         | -               | $\forall$   | 4     | $\dashv$     | 7    |

Table A42 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene (TCLP=TC Regulatory Level) -- Industrial Areas (30 Year Active Life)

| j                    | L      |       |              |        |          |                 |                        |        |        |                         |        | 1997          |      | 1998              |       |
|----------------------|--------|-------|--------------|--------|----------|-----------------|------------------------|--------|--------|-------------------------|--------|---------------|------|-------------------|-------|
| wo rarameters        | Area   | Depth | <del>_</del> | TCLP   | Wst Conc | ວ<br>/ <u>≫</u> | Cw / Cl Wst. Den Infil |        | X-well | X-well  Y- Well  Z-Well | Z-Well | 9-year Avg.   |      | 9-year Avg.       | T     |
| at nign end          | (mz)   | Œ)    |              | (mg/L) | (mg/kg)  | (Ľkg)           | (g/cm3)                | (m/yr) | (E)    | Œ                       | Œ      | $\overline{}$ | Rank | Rank Conc. (mg/L) | Rank  |
| Base Case            | 20200  | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 0.84                   | 0.17   | 430    | 85.91                   | 6.5    | 4.05E-03      |      | 2.01E-02          |       |
| X-Well & Infil       | 20200  | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 0.84                   | 0.46   | 102    | 92.09                   | 6.5    | 2.63E-02      | 8    | 1.66E-01          | T-    |
| X-Well & Y- Well     | 20200  | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 0.84                   | 0.17   | 102    | 0.00                    | 6.5    | 2.73E-02      | 1    | 1.01E-01          | 7     |
| Y-Well & Infil       | 20200  | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 28.0                   | 0.46   | 430    | 0.00                    | 6.5    | 4.14E-02      | 4    | 9.71E-02          | 1 6   |
| X-Well & Area        | 162000 | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 0.84                   | 0.17   | 102    | 142.35                  | 6.5    | 6.39E-02      | m    | 8.88E-02          | ) 4   |
| Wst. Conc & Area     | 162000 | 2.6   | 714          | 0.5    | 200      | 1000.00         | 0.84                   | 0.17   | 430    | 165.01                  | 6.5    | 8.87E-02      | -    | 8 78E-02          | ı,    |
| X-Well & Z-Well      | 20200  | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 0.84                   | 0.17   | 102    | 92.09                   | 1.3    | 1.30E-02      | 12   | 8.46E-02          | 9 (9  |
| Wst. Vol & Area      | 162000 | 2.6   | 2763.9       | 0.5    | 116.38   | 232.76          | 0.84                   | 0.17   | 430    | 165.01                  | 6.5    | 8.45E-02      | 2    | 8.43E-02          | , _   |
| Wst. Vol & X-Well    | 20200  | 2.6   | 2763.9       | 0.5    | 116.38   | 232.76          | 0.84                   | 0.17   | 102    | 60.76                   | 6.5    | 8.61E-03      | 15   | 8.17E-02          | .   & |
| Wst. Conc. & X-Well  | 20200  | 2.6   | 714          | 0.5    | 200      | 1000.00         | 0.84                   | 0.17   | 102    | 92.09                   | 6.5    | 8.60E-03      | 16   | 8.17E-02          |       |
| Wst. Conc. & Y- Well | 20200  | 2.6   | 714          | 0.5    | 200      | 1000.00         | 0.84                   | 0.17   | 430    | 0.00                    | 6.5    | 1.72E-02      | 9    | 6.85E-02          | 9     |
| Wst. Vol & Y- Well   | 20200  | 2.6   | 2763.9       | 0.5    | 116.38   | 232.76          | 0.84                   | 0.17   | 430    | 0.00                    | 6.5    | 1.72E-02      | 6    | 6.84E-02          | =     |
| Wst. Conc & Infil    | 20200  | 2.6   | 714          |        | 200      | 1000.00         | 0.84                   | 0.46   | 430    | 85.91                   | 6.5    | 1.05E-02      | 4    | 5.91E-02          | 12    |
| Wst. Vol & Infil     | 20200  | 2.6   | 2763.9       | 0.5    | 116.38   | 232.76          | 0.<br>28.              | 0.46   | 430    | 85.91                   | 6.5    | 1.07E-02      | 13   | 5.80E-02          | 13    |
| Y-Well & Area        | 162000 | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 0.84                   | 0.17   | 430    | 0.00                    | 6.5    | 3.74E-02      | 5    | 4.74E-02          | 4     |
| Infil & Area         | 162000 | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 0.8<br>28.0            | 0.46   | 430    | 165.01                  | 6.5    | 3.18E-02      | 9    | 4.29E-02          | 15    |
| Y-Well & Z-Well      | 20200  | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 28.0                   | 0.17   | 430    | 00.00                   | 1.3    | 8.05E-03      | 12   | 2.82E-02          | 19    |
| Wst. Vol & Wst Conc  | 20200  | 2.6   | 2763.9       | 0.5    | 200      | 1000.00         | 28.0                   | 0.17   | 430    | 85.91                   | 6.5    | 3.97E-03      | 19   | 2.51E-02          | 1     |
| Area & Z-Well        | 162000 | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 28.0                   | 0.17   | 430    | 165.01                  | 1.3    | 1.46E-02      | =    | 2.05E-02          | 18    |
| Infil & Z-Well       | 20200  | 2.6   | 714          | 0.5    | 116.38   | 232.76          | 0.84                   | 0.46   | 430    | 85.91                   | 1.3    | 4.15E-03      | 18   | 1.85E-02          | 9     |
| Wst. Conc & Z-Well   | 20200  | 2.6   | 714          | 0.5    | 500      | 1000.00         | 0.84                   | 0.17   | 430    | 85.91                   | 1.3    | 1.65E-03      | 21   | 1.15E-02          | 8     |
| Wst. Vo & Z-Well     | 20200  | 5.6   | 2763.9       | 0.5    | 116.38   | 232.76          | 28.0                   | 0.17   | 430    | 85.91                   | 1.3    | 1.66E-03      | 8    | 1.14E-02          | 21    |
|                      |        |       |              |        |          |                 |                        |        |        | 1                       | 1      | ┚             |      |                   |       |

Table A.43 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene -- Municipal Areas, 30 Year Active Life

|                      |              |              |                  | _              |   |                 |                     | <u>.                                    </u> |               |                |               | 1997                        |      | 1998                        |      |
|----------------------|--------------|--------------|------------------|----------------|---|-----------------|---------------------|--|---------------|----------------|---------------|-----------------------------|------|-----------------------------|------|
| at High End          | Area<br>(m2) | Uepth<br>(m) | Wst. Vol<br>(m3) | TCLP<br>(mg/L) | Wst Conc   Cw / Cl   Wst. Den<br>(mg/kg)   (L/kg)   (g/cm3) | Cw/Cl<br>(L/kg) | Wst. Den<br>(g/cm3) | m/yr)  | X-well<br>(m) | Y- Well<br>(m) | Z-Well<br>(m) | 9-year Avg.<br>Conc. (mg/L) | Rank | 9-year Avg.<br>Conc. (mg/L) | Rank |
| Base Case            | 60705        | 2.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 430           | 117.75         | 6.5           | 3.96E-02                    |      | 6.36E-02                    |      |
| Wst. Conc. & X-Well  | 60705        | 2.6          | 714              | 6.7            | 200   | 63.29           | 0.84                | 0.17   | 102           | 93.79          | 6.5           | 1.21E-01                    | 15   | 7.97E-01                    | -    |
| Wst. Vol & X-Well    | 60705        | 2.6          | 2763.9           | . 6.7          | 116.38  | 14.73           | 0.84                | 0.17   | 102           | 93.79          | 6.5           | 1.21E-01                    | 16   | 7.34E-01                    | 2    |
| Wst. Vol & Wst Conc  | 60705        | 2.6          | 2763.9           | 7.9            | 200   | 63.29           | 0.84                | 0.17   | 430           | 117.75         | 6.5           | 5.97E-02                    | 22   | 5.66E-01                    | 8    |
| Wst. Conc. & Y- Well | 60705        | 2.6          | 714              | 7.9            | 200   | 63.29           | 0.84                | 0.17   | 430           | 0.00           | 6.5           | 2.39E-01                    | 4    | 4.31E-01                    | 4    |
| Wst. Vol & Y- Well   | 60705        | 2.6          | 2763.9           | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 430           | 0.00           | 6.5           | 2.37E-01                    | 2    | 3.95E-01                    | 5    |
| Wst. Conc & Infil    | 60705        | 2.6          | 714              | 6.7            | 200   | 63.29           | 0.84                | 0.46   | 430           | 117.75         | 6.5           | 1.31E-01                    | 13   | 2.99E-01                    | 9    |
| Wst. Conc & TCLP     | 60705        | 2.6          | 714              | 39             | 200   | 12.82           | 0.84                | 0.17   | 430           | 117.75         | 6.5           | 1.84E-01                    | 7    | 2.74E-01                    | 7    |
| Wst. Vol & Infil     | 60705        | 2.6          | 2763.9           | 7.9            | 116.38  | 14.73           | 0.84                | 0.46   | 430           | 117.75         | 6.5           | 1.28E-01                    | 14   | 2.70E-01                    | 80   |
| Wst. Vol & TCLP      | 60705        | 2.6          | 2763.9           | 39             | 116.38  | 2.98            | 0.84                | 0.17   | 430           | 117.75         | 6.5           | 1.76E-01                    | 6    | 2.47E-01                    | 6    |
| X-Well & Y- Well     | 60705        | 2.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 102           | 0.00           | 6.5           | 2.79E-01                    | က    | 2.36E-01                    | 5    |
| X-Well & TCLP        | 60705        | 2.6          | 714              | 39             | 116.38  | 2.98            | 0.84                | 0.17   | 102           | 93.79          | 6.5           | 1.83E-01                    | 80   | 2.19E-01                    | =    |
| X-Well & Infil       | 60705        | 5.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.46   | 102           | 93.79          | 6.5           | 2.02E-01                    | 9    | 2.08E-01                    | 12   |
| X-Well & Z-Well      | 60705        | 2.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 102           | 93.79          | 1.3           | 1.33E-01                    | 12   | 2.02E-01                    | 13   |
| Wst. Conc & Z-Well   | 60705        | 2.6          | 714              | 7.9            | 200   | 63.29           | 0.84                | 0.17   | 430           | 117.75         | 1.3           | 2.30E-02                    | 56   | 1.21E-01                    | 4    |
| Y-Well & TCLP        | 60705        | 2.6          | 714              | 39             | 116.38  | 2.98            | 0.84                | 0.17   | 430           | 00'0           | 6.5           | 3.38E-01                    | -    | 1.14E-01                    | 15   |
| Wst. Vo & Z-Well     | 60705        | 2.6          | 2763.9           | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 430           | 117.75         | 1.3           | 2.28E-02                    | 27   | 1.11E-01                    | 16   |
| Wst. Conc & Area     | 420888       | 2.6          | 714              | 7.9            | 200   | 63.29           | 0.84                | 0.17   | 430           | 238.82         | 6.5           | 1.63E-01                    | 5    | 1.10E-01                    | 12   |
| Y-Well & Infil       | 60705        | 2.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.46   | 430           | 00'0           | 6.5           | 3.00E-01                    | 2    | 1.01E-01                    | 18   |
| Wst. Vol & Area      | 420888       | 2.6          | 2763.9           | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 430           | 238.82         | 6.5           | 1.47E-01                    | F    | 9.88E-02                    | 19   |
| TCLP & Infil         | 60705        | 2.6          | 714              | 39             | 116.38  | 2.98            | 0.84                | 0.46   | 430           | 117.75         | 6.5           | 1.05E-01                    | 11   | 7.17E-02                    | 20   |
| Y-Well & Z-Well      | 60705        | 5.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 430           | 0.00           | 1.3           | 7.96E-02                    | 18   | 5.66E-02                    | 21   |
| X-Well & Area        | 420888       | 2.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 102           | 217.62         | 6.5           | 7.27E-02                    | 19   | 4.56E-02                    | 22   |
| Infil & Z-Weli       | 60705        | 2.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.46   | 430           | 117.75         | 1.3           | 3.00E-02                    | 22   | 3.41E-02                    | 23   |
| TCLP & Z-Well        | 60705        | 2.6          | 714              | 39             | 116.38  | 2.98            | 0.84                | 0.17   | 430           | 117.75         | 1.3           | 3.24E-02                    | 24   | 3.22E-02                    | 24   |
| Y-Well & Area        | 420888       | 5.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 430           | 0.00           | 6.5           | 4.17E-02                    | 21   | 2.66E-02                    | 52   |
| TCLP & Area          | 420888       | 2.6          | 714              | 39             | 116.38  | 2.98            | 0.84                | 0.17   | 430           | 238.82         | 6.5           | 3.84E-02                    | 22   | 2.56E-02                    | 56   |
| Infil & Area         | 420888       | 2.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.46   | 430           | 238.82         | 6.5           | 3.30E-02                    | 23   | 2.04E-02                    | 27   |
| Area & Z-Well        | 420888       | 5.6          | 714              | 7.9            | 116.38  | 14.73           | 0.84                | 0.17   | 430           | 238.82         | 1.3           | 1.64E-02                    | 78   | 1.57E-02                    | 28   |

Table A44 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Benzene (TCLP=TC Regulatory Level) -- Municipal Areas

Rank ഗ 9 5 ω 12 4 5 9 8 19 2 1 21 Conc. (mg/L) 9-year Avg. 3.52E-02 1.64E-01 1.61E-01 1.51E-01 1.20E-01 1.11E-01 1.07E-01 1.01E-01 9.86E-02 9.67E-02 7.95E-02 7.73E-02 2.68E-02 2.00E-02 7.43E-02 6.45E-02 4.33E-02 3.10E-02 2.73E-02 2.60E-02 2.54E-02 1.50E-02 Rank 9 15 ω 4 73 2 9 თ 6 4 က 21 2 18 Ξ ß 9 Conc. (mg/L) 9-year Avg. 1.05E-02 4.05E-03 8.60E-03 8.61E-03 2.63E-02 2.73E-02 1.07E-02 1.30E-02 1.72E-02 1.72E-02 8.87E-02 4.14E-02 8.45E-02 3.97E-03 6.39E-02 8.05E-03 1.65E-03 1.66E-03 4.15E-03 3.74E-02 3.18E-02 1.46E-02 Cw / Cl | Wst. Den | Infil | X-well | Y- Well | Z-Well | 6.5 6.5 Ê 6.5 6.5 6.5 6.5 6.5 6.5 <del>د</del>: 6.5 6.5 6.5 6.5 6.5 1.3 <del>د</del>. <del>1</del>.3 6.5 6.5 <del>1</del>.3 117.75 117.75 117.75 93.79 93.79 93.79 93.79 238.82 238.82 117.75 238.82 217.62 117.75 9.0 8 117.75 Ê 9.0 8 238.82 8 0.00 Ê 8 102 102 102 102 8 430 102 89 430 438 88 89 83 5 8 83 89 430 430 83 430 (g/cm3) | (m/yr) (30 Year Active Life) 0.17 0.17 0.46 0.46 0.17 0.17 0.46 0.17 0.46 0.17 0.17 0.17 0.17 0.46 0.46 0.17 0.17 0.17 0.17 0.17 0.17 0.17 0.84 9. 8. 0.84 0.8 2 0.84 0.84 28 8 28.0 80.0 28. 0. 8 9, 8 8 9. 8. 28. 8 9.0 0.82 0.84 8 232.76 1000.00 (L/kg) 232.76 1000.00 232.76 232.76 232.76 232.76 1000.00 1000.00 1000.00 232.76 232.76 232.76 1000.00 232.76 232.76 232.76 232.76 232.76 232.76 232.76 Wst Conc (mg/kg) 116.38 116.38 116.38 116.38 116.38 116.38 116.38 116.38 116.38 116.38 116.38 200 116.38 116.38 116.38 116.38 28 200 200 116.38 200 200 (mg/L) TCLP 0.5 WSt. Vol 2763.9 (m3) 2763.9 2763.9 714 2763.9 714 2763.9 714 714 714 714 2763.9 714 714 714 714 714 714 714 714 Depth Ξ 2.6 2.6 2.6 5.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 5.6 2.6 2.6 2.6 2.6 2.6 5.6 2.6 2.6 Area 60705 60705 60705 60705 60705 60705 420888 60705 60705 60705 420888 60705 420888 60705 60705 60705 60705 420888 60705 420888 Vst. Conc. & Y- Well Two Parameters Vst. Vol & Wst Conc Wst. Conc. & X-Well at High End Nst. Conc & Z-Well Wst. Vol & X-Well Vst. Vol & Y- Well Nst. Conc & Area Well & Y- Well Vst. Conc & Infil Nst. Vo & Z-Well Vst. Vol & Area (-Well & Z-Well Nst. Vol & Infil -Well & Z-Well (-Well & Area K-Well & Infil -Well & Area -Well & Infil Base Case Area & Z-Well nfil & Z-Well nfil & Area

Table A.45 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Arsenic -- Industrial Areas, 30 Year Active Life

| Two Daramoters       |        |     |        |                |                                    |        |                                |      |        |         | ·      | 1997        |      | 1998        |      |
|----------------------|--------|-----|--------|----------------|------------------------------------|--------|--------------------------------|------|--------|---------|--------|-------------|------|-------------|------|
| at High End          | (m2)   | (m) | (m3)   | TCLP<br>(mg/L) | Wst Conc Cw / Cl<br>(mg/kg) (L/kg) |        | Wst. Den Infil<br>(g/cm3) (m/v | Ē    | X-well | Y- Well | Z-Well | 9-year Avg. | Dank | 9-year Avg. |      |
| Base Case            | 20200  | 2.6 | 714    | 1.1            | 393.3                              |        | 0.84                           | 0.17 | 430    | 6       | 6.5    | 1 02E_03    | Z Z  | 4 84F 62    | Kank |
| Wst. Conc. & X-Well  | 20200  | 2.6 | 714    | 1.1            | 1600                               | 1454.5 | 0.84                           | 0.17 | 102    | 60.76   | 8.5    | 1 165 00    |      | 1.04E-U3    |      |
| Wst. Vol & X-Well    | 20200  | 2.6 | 2763.9 | 1.1            | 393.3                              | 357.5  | 0.84                           | 0.17 | 102    | 20.70   | 0.0    | 1.135-02    | 0    | 3.23E-02    | -    |
| Wst. Vol & Wst Conc  | 20200  | 2.6 | 2763.9 | 1.7            | 1600                               | 1454.5 | 0.84                           | 2 12 | 130    | 00.70   |        | 1.12E-02    | 9    | 3.10E-02    | 2    |
| Wst. Conc. & Y- Well | 20200  | 2.6 | 714    | 1              | 1600                               | 1454 5 | 20.0                           | 2 7  | 25     | 93.91   | 0 0    | 7.46E-03    | 13   | 2.09E-02    | က    |
| Wst. Vol & YWell     | 20200  | 2.6 | 2763.9 | -              | 303.3                              | 357 6  | 50.0                           | - 1  | 55     | 90.0    | 6.5    | 2.11E-02    | -    | 2.07E-02    | 4    |
| X-Well & Infil       | 20200  | 26  | 717    |                | 0.000                              | 327.3  | 0.0                            | 0.1  | 430    | 0.00    | 6.5    | 2.06E-02    | 2    | 1.98E-02    | 5    |
| X-Well & Y- Well     | 20200  | 0 0 | 417    | -              | 393.3                              | 35/.5  | 0.84                           | 0.46 | 102    | 60.76   | 6.5    | 1.11E-02    | 7    | 1.63E-02    | 9    |
| X-Well & 7-Well      | 20202  | 0.7 | 417    |                | 393.3                              | 357.5  | 0.84                           | 0.17 | 102    | 0.00    | 6.5    | 1.58E-02    | 3    | 1.21E-02    | 7    |
| Wet Conc & Infi      | 20200  | 0 0 | 7.14   |                | 393.3                              | 357.5  | 0.84                           | 0.17 | 102    | 92:09   | 1.3    | 7.58E-03    | 12   | 1.05E-02    | 8    |
| Wet Vol & Infi       | 20200  | 0 0 | 417    | -              | 1600                               | 1454.5 | 0.84                           | 0.46 | 430    | 85.91   | 6.5    | 8.58E-03    | 6    | 9.27E-03    | 6    |
| VAC. VOI G IIIII     | 20200  | 7.0 | 2/63.9 | -              | 393.3                              | 357.5  | 0.84                           | 0.46 | 430    | 85.91   | 6.5    | 8.31E-03    | 9    | 8.83E-03    | 9    |
| A-well & ICLP        | 20200  | 2.6 | 714    | 4.9            | 393.3                              | 80.3   | 0.84                           | 0.17 | 102    | 92.09   | 6.5    | 5.90E-03    | 14   | 8.61E-03    | =    |
| WSt. Conc & ICLP     | 20200  | 2.6 | 714    | 4.9            | 1600                               | 326.5  | 0.84                           | 0.17 | 430    | 85.91   | 6.5    | 2.16E-03    | 19   | 7.47E-03    | 2    |
| WSt. VOI & ICLP      | 20200  | 2.6 | 2763.9 | 4.9            | 393.3                              | 80.3   | 0.84                           | 0.17 | 430    | 85.91   | 6.5    | 7.63E-03    | 1:   | 7.11E-03    | 1 2  |
| r-vveil & Inni       | 20200  | 2.6 | 714    | 1.1            | 393.3                              | 357.5  | 0.84                           | 0.46 | 430    | 0.00    | 6.5    | 1.17E-02    | 4    | 5 56F-03    | 2    |
|                      | 20200  | 2.6 | 714    | 4.9            | 393.3                              | 80.3   | 0.84                           | 0.17 | 430    | 0.00    | 6.5    | 9.66E-03    | -    | 5.34F-03    | 7,   |
| g                    | 162000 | 2.6 | 714    | 1.1            | 1600                               | 1454.5 | 0.84                           | 0.17 | 430    | 165.01  | 6.5    | 3.54E-03    | 16   | 4 22E-03    | 2 4  |
|                      | 162000 | 2.6 | 2763.9 | 1.1            | 393.3                              | 357.5  | 0.84                           | 0.17 | 430    | 165.01  | 6.5    | 3.37E-03    | 1 =  | 4 02F-03    | 2 5  |
| <u></u>              | 20200  | 2.6 | 714    |                | 1600                               | 1454.5 | 0.84                           | 0.17 | 430    | 85.91   | 1.3    | 2.02E-03    | 20   | 3.50F-03    | - 2  |
| Vell                 | 20200  | 2.6 | 2763.9 | Ę              | 393.3                              | 357.5  | 0.84                           | 0.17 | 430    | 85.91   | 1.3    | 1.98E-03    | 21   | 3.35E-03    | 5 6  |
|                      | 162000 | 2.6 | 714    | 1.1            | 393.3                              | 357.5  | 0.84                           | 0.17 | 102    | 142.35  | 6.5    | 1.76E-03    | 22   | 2 70F-03    | 2 8  |
| Well                 | 20200  | 2.6 | 714    | 1.1            | 393.3                              | 357.5  | 0.84                           | 0.17 | 430    | 00.0    | 1.3    | 4.00E-03    | 15   | 2 67F-03    | 7 2  |
|                      | 20200  | 2.6 | 714    | 6.4            |                                    | 80.3   | 0.84                           | 0.46 | 430    | 85.91   | 6.5    | 2.89E-03    | 18   | 2.31E-03    | 2    |
| rea                  | 162000 | 2.6 | 714    | 11             |                                    | 357.5  | 0.84                           | 0.17 | 430    | 0.00    | 6.5    | 9.45E-04    | 24   | 1.26E-03    | 1 2  |
| IIIII & Area         | 162000 | 5.6 | 714    |                |                                    | 357.5  | 0.84                           | 0.46 | 430    | 165.01  | 6.5    | 8.88E-04    | 82   | 1.16E-03    | 24   |
|                      | 20200  | 5.6 | 714    |                | -                                  | 357.5  | 0.84                           | 0.46 | 430    | 85.91   | 1.3    | 1.16E-03    | 23   | 1.07E-03    | 25   |
| TCLP & Area          | 162000 | 2.6 | 714    | 4.9            | 393.3                              | 80.3   | 0.84 (                         | 0.17 | 430 1  | 165.01  | 6.5    | 8.71E-04    | 27   | 1.04E-03    | 78   |
|                      | 20200  | 5.6 | 714    | 4.9            | $\dashv$                           | 80.3   |                                | 0.17 | 430 8  | 85.91   | 1.3    | 9.25E-04    | 25   | 9.05E-04    | 27   |
| Aled & L-vvell       | 162000 | 5.6 | 714    | -              | 393.3                              | 357.5  | 0.84                           | 0.17 | 430 1  | 165.01  | 1.3    | 3.80E-04    | 28   | 5.59E-04    | 88   |

Table A.46 Sensitivity Analysis Hydrotreating Off-site Landfill Scenario, Arsenic -- Municipal Areas, 30 Year Active Life

| Two Parameters       | Area   | Depth    | Wst. Vol | TCLP   | Wst Cone Cw / Cl Wet Pen | - N    | Wet       | 30       |   |        |        | 1997         |         | 1998     |      |
|----------------------|--------|----------|----------|--------|--------------------------|--------|-----------|----------|---|--------|--------|--------------|---------|----------|------|
| at High End          | (m2)   | <u> </u> | (m3)     | (mg/L) | (mg/kg)                  | (L/kg) | (g/cm3)   | (m/yr)   | (m)   | r-well | Z-Well | 9-year Avg.  |         |          |      |
| base Case            | 60705  | 5.6      | 714      | Ļ      | 393.3                    | 357.5  | 0 88      | 0 17     | \<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\<br>\ | 117 75 | 200    | Conc. (mg/L) | Na II K | 3        | Rank |
| Wst. Vol & Wst Conc  | 60705  | 2.6      | 2763.9   | -      | 1600                     | 1454 F | 0.87      | ; ;      |   | 117.73 | 0.0    | 1.92E-03     |         | 1.64E-03 |      |
| Wst. Conc. & X-Well  | 60705  | 2.6      | 714      | 1.1    | 1600                     | 1454 5 | 200       | 2 6      | 2   | 11/./5 | 6.5    | 7.46E-03     | 13      | 2.41E-02 | -    |
| Wst. Vol & X-Well    | 60705  | 2.6      | 2763.9   | 1.1    | 393.3                    | 357 E  | 0.00      | 2 0      | 201   | 93.79  | 6.5    | 1.15E-02     | 5       | 2.31E-02 | 2    |
| Wst. Conc. & Y- Well | 60705  | 2.6      | 714      | 1      | 1600                     | 1454.5 | 10.0      | 2 6      | 102   | 93.79  | 6.5    | 1.12E-02     | 9       | 2.20E-02 | 6    |
| Wst. Vol & Y- Well   | 60705  | 2.6      | 2763.9   | -      | 303.3                    | 267 5  | 0.04      |          | 630   | 0.00   |        | 2.11E-02     | -       | 1.07E-02 | 4    |
| X-Well & Infil       | 60705  | 2.6      | 714      | -      | 303.3                    | 357.5  | 0.04      | 0.1      | 430   | 0.00   | 6.5    | 2.06E-02     | 2       | 1.02E-02 | 5    |
| Wst. Conc & Infil    | 60705  | 2.6      | 714      | -      | 1600                     | 327.3  | 0.84      | 0.46     | 102   | 93.79  | 6.5    | 1.11E-02     | 7       | 7.63E-03 | 9    |
| Wst. Vol & Infil     | 60705  | 2.6      | 2763.9   | -      | 303 3                    | 257 5  | 20.0      | 0.46     | 630   | 117.75 | 6.5    | 8.58E-03     | 6       | 7.52E-03 | 7    |
| Wst. Conc & TCLP     | 60705  | 2.6      | 714      | 0.4    | 4600                     | 0.700  | 0.04      | 0.46     | 430   | 117.75 | 6.5    | 8.31E-03     | 9       | 7.16E-03 | 80   |
| Wst. Vol & TCLP      | 60705  | 2.6      | 2763.9   | 6.4    | 393.3                    | 320.0  | 20.00     | 0.17     | 430   | 117.75 | 6.5    | 2.16E-03     | 19      | 6.65E-03 | 6    |
| X-Well & Y- Well     | 60705  | 2.6      | 714      | -      | 303 3                    | 357 5  | 500       | 2   2    | 430   | 117.75 | 6.5    | 7.63E-03     | 11      | 6.34E-03 | 5    |
| X-Well & TCLP        | 60705  | 2.6      | 714      | 9      | 303.3                    | 5 6    | 50.0      |          | 702   | 0.00   | 6.5    | 1.58E-02     | က       | 6.14E-03 | =    |
| X-Well & Z-Well      | 60705  | 2.6      | 714      | -      | 202.2                    | 00.0   | 20.0      | 0.17     | 102   | 93.79  | 6.5    | 5.90E-03     | 4       | 5.73E-03 | 12   |
| Wst. Conc & Z-Well   | 60705  | 2.6      | 714      | -   -  | +                        | 327.3  | $\dashv$  | 0.17     | 102   | 93.79  | 1.3    | 7.58E-03     | 12      | 5.48E-03 | 13   |
| Wst. Vo & Z-Well     | 60705  | 2.6      | 2763.9   |        | +                        | 434.3  | $\dashv$  | 0.17     | 629   | 117.75 | 1.3    | 2.02E-03     | 8       | 3.36E-03 | 4    |
| Y-Well & TCLP        | 60705  | 2.6      | 714      | 6 4    | 303.3                    | 50,00  | $\top$    | 7 . 1    | 8   | 117.75 | 5.3    | 1.98E-03     | 21      | 3.20E-03 | 15   |
| Y-Weil & Infil       | 60705  | 2.6      | 714      | ;  -   | +                        | 367 5  | $\dagger$ | 7        | 62  | 0.00   | 6.5    | 9.66E-03     | ω       | 2.64E-03 | 19   |
| Wst. Conc & Area     | 420888 | 26       | 714      |        | +                        | 0.700  | $\dashv$  | 0.46     | 7   | 0.0    | 6.5    | 1.17E-02     | 4       | 2.53E-03 | 11   |
|                      | 420888 | 2.6      | 2763.9   | =   -  | $\dashv$                 | 1434.3 | $\dashv$  | 0.17     | _   | 238.82 | 6.5    | 3.54E-03     | 16      | 2.29E-03 | 9    |
| TCLP & Infil         | 60705  | 2.6      | 714      | 6 4    | +                        | 6,70   | $\dagger$ | 0.1      | $\dashv$  | 238.82 | 6.5    | 3.37E-03     | 17      | 2.18E-03 | 19   |
| Y-Well & Z-Well      | 60705  | 2.6      | 714      |        | +                        | 357 E  | +         | -        | _   | 117.75 | 6.5    | 2.89E-03     | 18      | 1.85E-03 | 8    |
| e e                  | 420888 | 2.6      | 714      | :   -  | +                        | 357.5  | 0.04      | 4        | $\top$  | 0.00   | 1.3    | 4.00E-03     | 15      | 1.33E-03 | 21   |
| Infil & Z-Well       | 60705  | 2.6      | 714      | 1      | ┿                        | 357 E  | +         | 4        | - †   | 217.62 | 6.5    | 1.76E-03     | 22      | 1.03E-03 | 22   |
| TCLP & Z-Well        | 60705  | 2.6      | 714      | 40     | +                        | 5. 5.  | $\dashv$  | 4        | ᅥ   | 117.75 | 1.3    | 1.16E-03     | 23      | 9.18E-04 | 23   |
| Y-Well & Area        | 420888 | 2.6      | 714      | 2 -    | ╁                        | 00.3   | +         | -        | $\dashv$  |        | 5.     | 9.25E-04     | 25      | 8.31E-04 | 24   |
| TCLP & Area          | 420888 | 26       | 714      | 0 7    | +                        | 0.70   | $\dashv$  |          | _   | _      | 6.5    | 9.45E-04     | 24      | 5.76E-04 | 25   |
|                      | 420888 | 26       | 714      | 2 -    | +                        | 80.3   | +         | _        | 7   | _      | 6.5    | 8.71E-04     | 27      | 5.63E-04 | 92   |
| /eli                 | 420888 | 26       | +        |        | +                        | 027.2  | $\dashv$  | $\dashv$ | $\neg \uparrow$   |        | 6.5    | 8.88E-04     | 82      | 5.24E-04 | 27   |
|                      |        |          | $\dashv$ |        | 393.3                    | 35/.5  | 0.84      | 0.17     | 33  | 238.82 | 1.3    | 3.80E-04     | 28      | 3.49E-04 | 88   |

Table A.47 Off-Spec Products and Fines Off-site Landfill/Benz(a)anthracene --Industrial Areas, 30 Year Active Life

|                       |        |       |                    | _              |         |         |           |          |          |         |       |             |          |              |       |
|-----------------------|--------|-------|--------------------|----------------|---------|---------|-----------|----------|----------|---------|-------|-------------|----------|--------------|-------|
| Two Parameters        | Area   | Depth | Depth Wst. Vol TCI | ۵              | WetConc | 2       | Met Den   |          | <u> </u> |         |       | 1           |          | 1998         |       |
| at High End           | (m2)   |       | (m3)               | . <del>2</del> | (mg/kg) |         | (a/cm3)   |          | Y-Well   | (m) (m) | N     | 9-year Avg. |          | 9-year Avg.  |       |
| Base Case             | 20200  | 2.15  | 2159.52            | 0.013          | . 1     | 923 08  | 1 26      |          | _ [-     | (111)   | (III) |             | Капк     | Conc. (mg/L) | Rank  |
| Wst. Vol & X-Well     | 20200  | 2 15  | 15600 E            | 5              | ! ;     | 00.020  | 1.20      | 5        | 430      | 83.91   | 6.5   | 4.16E-06    |          | 1.31E-05     |       |
| X-Well & Infil        | 20200  | 2 45  | 2450 52            | 5 6            | 2 9     | 923.08  | 1.26      | 0.17     | 102      | 60.76   | 6.5   | 1.04E-04    | 7        | 7.02E-04     | -     |
| Wet Vol & Infi        | 20200  | 2.7   | 70.6017            | <b>-</b> 1.    | 12      | 923.08  | 1.26      | 0.46     | 102      | 92.09   | 6.5   | 3.19E-04    | 2        | 6.63E-04     | 2     |
| St. VOI & IIIII       | 20200  | 2.15  |                    | 0.013          | 12      | 923.08  | 1.26      | 0.46     | 430      | 85.91   | 6.5   | 2.00E-04    | 4        | 5 43F-04     | ~     |
| Wst. Conc. & X-Well   | 20200  | 2.15  |                    | 0.013          | 28      | 2153.85 | 1.26      | 0.17     | 102      | 60.76   | 6.5   | 9.68E-05    | œ        | 4 89F-04     | , -   |
| X-Well & ∠-Well       | 20200  | 2.15  | 2159.52            | 0.013          | 12      | 923.08  | 1.26      | 0.17     | 102      | 92 09   | 13    | 1 BOE 04    | , "      | 4 475 04     |       |
| X-Well & Y- Well      | 20200  | 2.15  | 2159.52            | 0.013          | 12      | 923.08  | 1.26      | 0 17     | 102      | 9       | 2 0   | 100         | , ,      | 4.1/5-04     | n     |
| Y-Well & Infil        | 20200  | 2.15  | 2159.52            | 0.013          | 12      | 923 AB  | 1 26      |          | 3        | 3 6     | 5.0   | Z.03E-04    | 2        | 4.09E-04     | 9     |
| Wst. Conc & Infil     | 20200  | 2 15  | 2159 52            | 0              | 1 %     | 24.50   | 07.1      | 9 9      | 430      | 0.00    | 6.5   | 3.85E-04    | -        | 2.30E-04     | 7     |
| X-Well & Area         | 162000 | 2 15  | 2450 52            |                | 3 9     | 4100.00 | 97.1      | 0.46     | 430      | 85.91   | 6.5   | 1.49E-04    | 9        | 2.15E-04     | 8     |
| Wet Vol & V. Mail     | 2000   | 2.13  | 20.8012            | 5 6            | 17      | 923.08  | 1.26      | 0.17     | 102      | 142.35  | 6.5   | 6.13E-05    | 6        | 9.27E-05     | 6     |
| 2. Vol. 1 - Well      | 20202  | 0 :   | 15690.5            |                | 12      | 923.08  | 1.26      | 0.17     | 430      | 0.00    | 6.5   | 3.17E-05    | 13       | 7.77E-05     | 9     |
| Wat. Colic. & T- Well |        |       |                    |                | 28      | 2153.85 | 1.26      | 0.17     | 430      | 0.00    | 6.5   | 3.03E-05    | 14       | 6 07F-05     | =     |
| wst. vol & Area       | 162000 | 2.15  | 15690.5            | 0.013          | 12      | 923.08  | 1.26      | 0.17     | 430      | 165.01  | 6.5   | 5 13F-05    | Ę        | 5 70E 0E     | =   = |
| Innii & Area          | 162000 | 2.15  | 2159.52            | 0.013          | 12      | 923.08  | 1.26      | 0.46     | 430      | 165 01  | 6.5   | 3 74E OF    | 5 6      | 20.136       | 7 9   |
| Infil & Z-Well        | 20200  | 2.15  | 2159.52 0.013      | 0.013          | 12      | 923.08  | 1.26      | 0.46     | 730      | 85 04   | 3 :   | 3.7.15.03   | <u>,</u> | 4.04E-U5     | 2     |
| Y-Well & Z-Well       | 20200  | 2.15  | 2159.52            | 0.013          | 12      | 903.08  | +         | 1        | 3 5      | 00.00   | ?     | 3.84E-U5    | =        | 4.45E-05     | 4     |
| Wst. Vol & Wst Conc   | 20200  |       |                    | 0 013          | +       | 2452 05 | $\dagger$ | <u> </u> | 950      | 0.00    | 1.3   | 1.94E-05    | 9        | 3.02E-05     | 15    |
| Wst. Conc & Area      | 162000 | 2.15  | 2150 52            | 0.010          | +       | 7103.00 | $\dashv$  | 0.17     | $\dashv$ | 85.91   | 6.5   | 4.73E-06    | 19       | 2.60E-05     | 16    |
| Wet Vo & 7.Well       | 00000  | 2 , 0 | 4.000.02           | 20.0           | +       | 7103.80 | 1.26      | 0.17     | 430      | 165.01  | 6.5   | 2.06E-05    | 15       | 2.50E-05     | 17    |
| Wet Cope 8 7 Mell     |        |       |                    | 0.013          | -       | 923.08  | 1.26      | 0.17     | 430      | 85.91   | 1.3   | 3.07E-06    | 28       | 1.80E-05     | 180   |
| V-Mail & Area         | 20200  | 2.73  | 2159.52            | 0.013          |         | 2153.85 | 1.26      | 0.17     | 430      | 85.91   | 1.3   | 2.93E-06    | 21       | 1.38E-05     | 19    |
| Area & Z.Mell         | 102000 | 0, 7  | 75.6617            | 0.013          | +       | 923.08  |           | 0.17     | 430      | 0.00    | 6.5   | 9.87E-06    | 17       | 1.35E-05     | 20    |
| a a c-well            |        | 7.13  | 729.52             | 0.013          | 12      | 923.08  | 1.26      | 0.17     | 430      | 165.01  | 1.3   | 6.16E-06    | 92       | 8.90E-06     | 21    |

Table A.48 Off-Spec Products and Fines Off-site Landfill/Benz(a)anthracene -- Municipal Areas, 30 Year Active Life

|   |         | L             |                |         |           |         |           |          |         |                      |        |               |          |              |      |
|---|---------|---------------|----------------|---------|-----------|---------|-----------|----------|---------|----------------------|--------|---------------|----------|--------------|------|
| Two Parameters                          | Area    | Depth         | Depth Wst. Vol | TCLP    | Wst Conc  | 7       | Wet       |          | ,       | ;                    |        | 1997          |          | 1998         |      |
| at High End                             | (m2)    | Œ             | (m3)           | (mg/L)  | (mg/kg)   | (L/kg)  |           | (m/vr)   | Y-Well  | Y-Well Y-Well Z-Well | Z-Well | 9-year Avg.   |          |              |      |
| Base Case                               | 60705   | 2 15          | 2159 52        |         | 5         | 100000  | Т         | ,        |         | (1111)               | (III)  | Conc. (mg/L.) | Rank     | Conc. (mg/L) | Rank |
| Wst. Vol & X-Well                       | 60705   | ٠.            | A REON E       |         | 7         | 923.00  | 1.26      | 0.17     | 430     | 117.75               | 6.5    | 4.16E-06      |          | 1.42E-05     |      |
| Wst Vol & Infil                         | 80705   |               |                |         | 71        | 923.08  | 1.26      | 0.17     | 102     | 93.79                | 6.5    | 1.04E-04      | 7        | 8.56E-04     | -    |
| Wet Cong & VIME!                        | 00/00   |               | -              |         | 12        | 923.08  | 1.26      | 0.46     | 430     | 117.75               | 6.5    | 2.00E-04      | 4        | 5.09F-04     | ,    |
| Wat. Colic. & A-Well                    | 60/09   | 2.15          |                | 0.013   | 28        | 2153.85 | 1.26      | 0.17     | 102     | 93.79                | 6.5    | 9 68F-05      | α        | A 22E 04     | 1 6  |
| X-Well & Infil                          | 60705   | 2.15          | 2159.52        | 0.013   | 12        | 923.08  | 1.26      | 0.46     | 102     | 93 79                | 8.5    | 2 10E 04      | ,        | 4.23E-04     | ,    |
| X-Well & Z-Well                         | 60705   | 2.15          | 2159.52        | 0.013   | 12        | 923.08  | 1 26      | 0 17     | 103     | 02 70                |        | 201.01        | ,        | 3. I 3E-U4   | 4    |
| X-Well & Y- Well                        | 60705   | 2.15          | 2159.52        | 0.013   | 12        | 923.08  | 1 26      | ,        | 3 6     | 93.73                | ?      | 1.50E-04      | î        | 2.26E-04     | 2    |
| Wst. Conc & Infil                       | 60705   | 2.15          | _              | 0.013   | , ,       | 2459 05 | 1.50      |          | 701     | 0.00                 | 6.5    | 2.85E-04      | 3        | 2.18E-04     | 9    |
| Y-Well & Infil                          | 80705   | 2 15          | -              | 2 2     | 07        | 69.6617 | 1.26      | 0.46     | 430     | 117.75               | 6.5    | 1.49E-04      | 9        | 1.70E-04     | 7    |
| Wet Vol & V Well                        | 20700   | 2             | _              | 0.013   | 12        | 923.08  | 1.26      | 0.46     | 430     | 0.00                 | 6.9    | 3.85E-04      | -        | 1.06E-04     | @    |
| - A - A - A - A - A - A - A - A - A - A | C0 / 00 | 2.15          | 15690.5        | 0.013   | 12        | 923.08  | 1.26      | 0.17     | 430     | 0.00                 | 6.5    | 3 17E-05      | 13       | 7 715 05     | 0    |
| WSt. Vol & WSt Conc                     | 60705   | 2.15          | 15690.5        | 0.013   | 28        | 2153.85 | 1.26      | 0.17     | 430     | 117 75               | 8 5    | 4 725 06      | 2 5      | 7.7.12.03    | n !  |
| Wst. Vol & Area                         | 420888  | 2.15          | 15690.5        | 0.013   | 12        | 923 08  | 1 26      |          | +       | 2 2                  | 3      | 4.735-00      | <u>~</u> | 5.5ZE-05     | 10   |
| Wst. Conc. & Y- Well                    | 60705   | _             |                | 0 0 1 3 | 3 00      | 24.00   | 1.20      | <u> </u> | 7       | 238.82               | 6.5    | 5.13E-05      | 10       | 5.19E-05     | =    |
| Infil & Z-Well                          | 60705   | _             |                | 2 6     | 07        | 4153.85 | 1.26      | 0.17     | 430     | 0.00                 | 6.5    | 3.03E-05      | 14       | 4.52E-05     | 12   |
|   | 430000  |               | _              | 0.013   | 7.        | 923.08  | 1.26      | 0.46     | 430     | 117.75               | 1.3    | 3.84E-05      | =        | 3.62E-05     | 13   |
| -                                       | 740000  | $\rightarrow$ | $\rightarrow$  |         | 12        | 923.08  | 1.26      | 0.17     | 102     | 217.62               | 6.5    | 6.13E-05      | 6        | 3.56F-05     | 14   |
|   | 20/00   | 2.15          | 15690.5        | 0.013   | 12        | 923.08  | 1.26      | 0.17     | 430     | 117.75               | 13     | 3 075-08      | 30       | 3 465 06     |      |
|   | 420888  | 2.15          | 2159.52        | 0.013   | 12        | 923.08  | 1.26      | 0.46     | +       | 238 82               | 8 5    | 2 745 06      | 2 ;      | 3.435-03     | 0    |
| Wst. Conc & Z-Well                      | 60705   | 2.15          | 2159.52        | 0.013   | 28        | 2153.85 | $\dagger$ | 0 17     | +       | 447 75               | 3      | 3.7.15-03     | 2        | 2.1/E-05     | 9    |
| Wst. Conc & Area                        | 420888  | 2.15          | +              | 0 013   | $\dagger$ | 3452 05 | -         |          | +       | 07./1                | 5.     | 2.93E-06      | 21       | 1.95E-05     | 17   |
| T                                       | 60705   | -+-           | -              |         | +         | 4103.65 |           | 0.17     |         | 238.82               | 6.5    | 2.06E-05      | 15       | 1.86E-05     | 18   |
|   | 42088   | +             | -              | 2 0 0   | 71        | 923.08  | 7         | 0.17     | 430     | 0.00                 | 1.3    | 1.94E-05      | 16       | 1.76E-05     | 19   |
|   | 420888  |               | -+-            | 0.013   | 7,        | 923.08  | 7         | 0.17     |         | 0.00                 | 6.5    | 9.87E-06      | 12       | 8.35E-06     | 20   |
|   |         |               |                |         | 7         | 923.08  | 1.26      | 0.17     | 430   2 | 238.82               | 1.3    | 6.16E-06      | 18       | 6.74E-06     | 21   |

Table A.49 Sensitivity Analysis with TCLP set to High-End Value, Off-Spec Products and Fines Off-site Landfill/Benz(a)anthracene -- Industrial Areas, 30 Year Active Life

|                     |        |       |       | ٠             |           |                     |                |                                   |        |        |         |        | 1997         |      | 1998                                |      |
|---------------------|--------|-------|-------|---------------|-----------|---------------------|----------------|-----------------------------------|--------|--------|---------|--------|--------------|------|-------------------------------------|------|
| Two Parameters      | Area   | Depth | Wst   | Wst. Vol      | 10LP      | /ol TCLP   Wst Conc | <u>დ</u><br> გ | Wst. Den Infil   X-well   Y- Well | III    | X-well | Y- Well | Z-Well | 9-year Avg.  |      | 9-year Avg.                         |      |
| at High End         | (m2)   | Œ     | Quant | (m3)          | (mg/L) (i | (mg/kg)             | (L/kg)         | (g/cm3) (m/yr)                    | (m/yr) | Ξ      | Œ       | Œ      | Conc. (mg/L) | Rank | Conc. (mg/L) Rank Conc. (mg/L) Rank | Rank |
| Base Case           | 20200  | -     | 2160  |               | 52 0.013  | 12                  | 923.08         | 1.26                              | 0.17   | 430    | 85.91   | 6.5    | 4.16E-06     |      | 1.31E-05                            |      |
|                     | 20200  | 2.15  | 1814  | 2159.52       | 52 0.013  | 12                  | 923.08         | 1.26                              | 0.17   | 102    | 92.09   | 6.5    | 8.46E-05     | 7    | 2.91E-04                            | -    |
| Infiltration        | 20200  | 2.15  | 814   | 2159.         | 52 0.013  | 12                  | 923.08         | 1.26                              | 0.46   | 430    | 85.91   | 6.5    | 9.29E-05     | -    | 9.56E-05                            | 2    |
|                     | 20200  | 2.15  | 1814  | 2159.         | 52 0.013  | 12                  | 923.08         | 1.26                              | 0.17   | 65     | 0.00    | 6.5    | 2.80E-05     | 3    | 4.18E-05                            | 3    |
| Wste Volume         |        | 2.15  | 13180 | 15690.5       | 0.013     | 12                  | 923.08         | 1.26                              | 0.17   | 430    | 85.91   | 6.5    | 4.68E-06     | 2    | 2.41E-05                            | 4    |
| Waste Concentration | 20200  | 2.15  | 1814  | 2159.52 0.013 | 0.013     | 28                  | 2153.85        | 1.26                              | 0.17   | 430    | 85.91   | 6.5    | 4.48E-06     | 2    | 1.89E-05                            | 2    |
| •                   | 162000 | 2.15  | 15690 | 2159          | .52 0.013 | 12                  | 923.08         | 1.26                              | 0.17   | 430    | 165.01  | 6.5    | 9.38E-06     | 4    | 1.17E-05                            | 9    |
|                     | 20200  | 2.15  | 1814  | 2159.52 0.013 | 0.013     | 12                  | 923.08         | 1.26                              | 0.17   | 430    | 85.91   | 1.3    | 2.70E-06     | 9    | 9.34E-06                            | 7    |

Table A.50 Sensitivity Analysis with TCLP set to High-End Value, Off-Spec Products and Fines Off-site Landfill/Benz(a)anthracene -- Municipal Areas, 30 Year Act

|                     |             |       |            |                         |        |                |                                   |                       |         |        |         |        | 1997   |      | 1998                                |      |
|---------------------|-------------|-------|------------|-------------------------|--------|----------------|-----------------------------------|-----------------------|---------|--------|---------|--------|--|------|-------------------------------------|------|
| Iwo Parameters      | Area        | Depth | Wst.       | Wst. Vol                | TCLP   | Wst Conc       | ິ<br> ວ<br> <br> ວ<br> <br> ວ<br> | Wst. Den              | In file | N-well | Y- Well | Z-Well | TCLP Wst Conc Cw / Cl Wst. Den Infil X-well Y- Well Z-Well 9-year Avg. |      | 9-year Avg.                         |      |
| at High End         | (m2)        | Œ     | (m) Quant. | (m3)                    | (mg/L) | (mg/L) (mg/kg) | (L/kg)                            | (L/kg) (g/cm3) (m/yr) | (m/yr)  | E      | Ê       | Ê      | Conc. (mg/L)   | Rank | Conc. (mg/L) Rank Conc. (mg/L) Rank | Rank |
| Base Case           | 60705       | 2.15  | 1814       | 2.15 1814 2159.52       | 0.013  | 12             | 923.08                            | 1.26                  | 0.17    | 430    | 117.75  | 6.5    | 4.16E-06   |      | 1.42E-05                            |      |
| X-well              | 60705       | 2.15  | 1814       | 2.15 1814 2159.52       | 0.013  | 12             | 923.08                            | 1.26                  | 0.17    | 102    | 93.79   | 6.5    | 8.46E-05   | 2    | 2.03E-04                            | -    |
| Infiltration        | 60705       | 2.15  | 1814       | 2159.52                 | 0.013  | 12             | 923.08                            | 1.26                  | 0.46    | 430    | 117.75  | 6.5    | 9.29E-05   | -    | 7.32E-05                            | 2    |
| Wste Volume         | 60705       | 2.15  | 2.15 13180 | 15690.5                 | 0.013  | 12             | 923.08                            | 1.26                  | 0.17    | 430    | 117.75  | 6.5    | 4.68E-06   | 5    | 4.52E-05                            | 3    |
| Waste Concentration | 60705       | 2.15  | 1814       | 60705 2.15 1814 2159.52 | 0.013  | 28             | 2153.85                           | 1.26                  | 0.17    | 430    | 117.75  | 6.5    | 4.48E-06   | 9    | 2.64E-05                            | 4    |
| Y-well              | 60705       | 2.15  |            | 1814 2159.52            | 0.013  | 12             | 923.08                            | 1.26                  | 0.17    | 430    | 0.00    | 6.9    | 2.80E-05   | က    | 2.43E-05                            | 5    |
| Z-well              | 60705       | 2.15  | 1814       | 1814 2159.52            | 0.013  | 12             | 923.08                            | 1.26                  | 0.17    | 430    | 117.75  | 1.3    | 2.70E-06   | 7    | 1.03E-05                            | 9    |
| Area                | 420888 2.15 | 2.15  | 15690      | 15690 2159.52           | 0.013  | 12             | 923.08                            | 1.26                  | 0.17    | 430    | 238.82  | 6.5    | 9.38E-06   | 4    | 8.22E-06                            | _    |

Table A.51 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene -- Industrial Areas, 30 Year Active Life

|                      | -      |     |          |              |                  |         |           |        |                 |        |                |              |       |              |      |
|----------------------|--------|-----|----------|--------------|------------------|---------|-----------|--------|-----------------|--------|----------------|--------------|-------|--------------|------|
| Two Paramotors       | - V    | 4   | 147.4 V1 |              |                  |         |           |        |                 |        |                | 1997         |       | 1998         |      |
| at High End          | (m2)   |     | (m) (m3) | וכר <i>ף</i> | Wst Conc Cw / Ci | CW / CI | Wst. Den  | Infil  | X-well          | =      | Z-Well         | 9-year Avg.  |       |              |      |
| Raco Caco            | /20000 |     | (0111)   | (11.8/L)     | (mg/kg)          | (UKG)   | (g/cm3)   | (m/yr) | (E)             | Œ      | Œ              | Conc. (mg/L) | Rank  | Conc. (mg/L) | Rank |
| Let 9 Viet           | 20200  | 7.0 | 77.74    | 1.49         | 43.73            | 29.35   | 1.2       | 0.17   | 430             | 85.91  | 6.5            | 3.93E-03     |       | 5.07E-02     |      |
| IIIII & AWell        | 20200  | 2.6 | 2214     | 1.49         | 43.73            | 29.35   | 1.2       | 0.46   | 102             | 92.09  | 6.5            | 7.33E-02     | 7     | 3.93E-01     | -    |
| ICLP & xwell         | 20200  | 2.6 | 2214     | 4.2          | 43.73            | 10.41   | 1.2       | 0.17   | 102             | 60.76  | 6.5            | 6.40E-02     | 9     | 3.37F-01     | 6    |
| Ywell & Xwell        | 20200  | 2.6 | 2214     | 1.49         | 43.73            | 29.35   | 1.2       | 0.17   | 102             | 0.00   | 6.5            | 7.69F-02     | 9     | 2.61E.01     | 1 6  |
| Ywell & TCLP         | 20200  | 2.6 | 2214     | 4.2          | 43.73            | 10.41   | 1.2       | 0.17   | 430             | 000    | 6.5            | 1 23E-01     | , ~   | 2.51E.01     | ,    |
| Xwell & Wst. Conc    | 20200  | 2.6 | 2214     | 1.49         | 100              | 67.11   | 12        | 0 17   | 102             | 60.76  | 8.5            | 2 535 02     | , ?   | 2.355-01     | *  r |
| Area & Wst. Vol      | 162000 | 2.6 | 12500    | 1.40         | 43 73            | 20 340  | 1 2       | 7,1    |                 | 2 2    | 3 6            | 2.33E-02     | 17    | 2.33E-Ui     | ဂ    |
| Ywell & Infil        | 20200  | 36  | 2244     | 2 9          | 5 5              | 20.073  | 7.        | 2      | <del>ا</del> رگ | 10.00  | 0.5            | 2.26E-01     | -     | 2.30E-01     | 9    |
| Xamil & Met Vol      | 20200  | 0 0 | 4177     | 94.          | 43.73            | 29.35   | 1.2       | 0.46   | 430             | 0.00   | 6.5            | 1.15E-01     | 4     | 2.23E-01     | 7    |
| Aveil & Zuell        | 20200  | 4.0 | 12500    | 1.49         | 43.73            | 29.349  | 1.2       | 0.17   | 102             | 92.09  | 6.5            | 2.49E-02     | 22    | 2.20E-01     | 8    |
| Aweil & Zwell        | 20200  | 9.7 | 2214     | 1.49         | 43.73            | 29.35   | 1.2       | 0.17   | 102             | 92.09  | 1.3            | 3.65E-02     | 15    | 2.18E-01     | 6    |
| TWE!! & VVST. VOI    | 20200  | 2.6 | 12500    | 1.49         | 43.73            | 29.349  | 1.2       | 0.17   | 430             | 0.00   | 6.5            | 4.98E-02     | 14    | 1.97E-01     | 10   |
| rweil & Wst Conc     | 20200  | 2.6 | 2214     | 1.49         | 100              | 67.11   | 1.2       | 0.17   | 430             | 0.00   | 6.5            | 5.09E-02     | 13    | 1.78E-01     | +    |
| ICLP & WSt. Vol      | 20200  | 2.6 | 12500    | 4.2          | 43.73            | 10.412  | 1.2       | 0.17   | 430             | 85.91  | 6.5            | 3.20E-02     | 16    | 1.70E-01     | 12   |
| Area & Xwell         | 162000 | 2.6 | 2214     | 1:49         | 43.73            | 29.35   | 1.2       | 0.17   | 102             | 142.35 | 6.5            | 1.15E-01     | 5     | 1.68E-01     | 13   |
| infil & Wst. Vol     | 20200  | 2.6 | 12500    | 1.49         | 43.73            | 29.349  | 1.2       | 0.46   | 430             | 85.91  | 6.5            | 3.11E-02     | 18    | 1 66F-01     | 14   |
| Area & Wst. Conc     | 162000 | 5.6 | 2214     | 1.49         | 100              | 67.11   | 1.2       | 0.17   | 430             | 165.01 | 6.5            | 1.25E-01     | ~     | 1 38F-01     | - 12 |
| Infil & TCLP         | 20200  | 2.6 | 2214     | 4.2          | 43.73            | 10.41   | 1.2       | 0.46   | 430             | 85.91  | 6.5            | 6.45F-02     | σ     | 1 34E-01     | 9    |
| nfil & Wst. Conc     | 20200  | 2.6 | 2214     | 1.49         | 92               | 67.11   | 1.2       | 0.46   | 430             | 85.91  | 6.5            | 3.08F-02     | , 6   | 134E-01      | 2 5  |
| TCLP & Wst Conc      | 20200  | 2.6 | 2214     | 4.2          | 9                | 23.81   | 1.2       | 0.17   | 430             | 85.91  | 6.5            | 3 12F-02     | 2   2 | 1 325 01     | - 0  |
| Area & Ywell         | 162000 | 2.6 | 2214     | 1.49         | 43.73            | 29.35   | 1.2       | 0.17   | 89              | 0.00   | 6.5            | 6 66F-02     | =   « | 8 77E-02     | 2 6  |
| Area & TCLP          | 162000 | 2.6 | 2214     | 4.2          | 43.73            | 10.41   | 1.2       | 0.17   | ╁               | 165.01 | 6.5            | 6.35E-02     | , =   | 7 69F-02     | 2 8  |
| Area & Infil         | 162000 | 2.6 | 2214     | 1.49         | 43.73            | 29.35   | 1.2       | 0.46   | 430             | 165.01 | 6.5            | 5.46E-02     | 2     | 7 47F-02     | 3 2  |
| Wst. Vol & Wst. Conc | 20200  | 5.6 | 12500    | 1.49         | 100              | 67.11   | $\dagger$ | 0.17   | +-              | 85.91  | 6.5            | 1.15E-02     | !  %  | 7.31E-02     | 32   |
| Ywell & Zwell        | 20200  | 2.6 | 2214     | 1.49         | 43.73            | 29.35   | 1.2       | 0.17   | 430             | 0.00   | 6.7            | 2.25F-02     | 1 8   | 7 13E-02     | 3 1  |
| TCLP & Zwell         | 20200  | 5.6 | 2214     | 4.2          | 43.73            | 10.41   | 1.2       | 0.17   | 82              | 85.91  | 1.3            | 1.18E-02     | 24    | 4 29F-02     | 3 4  |
| Infil & Zwell        | 20200  | 2.6 | 2214     | 1.49         | 43.73            | 29.35   | 1.2       | 0.46   | 430             | 85.91  | 1.3            | 1.15E-02     | 35    | 4 26F-02     | ۲,   |
| Area & Zwell         | 162000 | 2.6 | 2214     | 1.49         | 43.73            | 29.35   | 1.2       | 0.17   | 430             | 165.01 | <del>1.3</del> | 2.61E-02     | 8     | 3.80E-02     | 3 8  |
| Wst. Vol & Zweil     | 20200  | 5.6 |          | 149          | _                | 29.35   | 1.2       | 0.17   | 430             | 85.91  | 1.3            | 4.79E-03     | 28    | 3.29E-02     | 27   |
| Wst Conc & Zwell     | 20200  | 2.6 | 2214     | 1.49         | 100              | 67.11   | 1.2       | 0.17   | 430             | 85.91  | 1.3            | 4.86E-03     | 27    | 2.99E-02     | 78   |
|                      |        |     |          |              |                  |         |           |        |                 |        | 1              |              | -     |              |      |

A.52 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene (TCLP = TC Regulatory Level) -- Industrial Areas (30 Year Active Life)

|      |                           | Rank                           |           | 1             | 5            | က             | 4               | 5             | 9             | 7               | 8                | 6                 | 10               | 11               | 12           | 13           | 14               | 15                | 16            | 17           | 18                         | 19            | 20               | 21               |
|------|---------------------------|--------------------------------|-----------|---------------|--------------|---------------|-----------------|---------------|---------------|-----------------|------------------|-------------------|------------------|------------------|--------------|--------------|------------------|-------------------|---------------|--------------|----------------------------|---------------|------------------|------------------|
|      | 9-year Avg.               | Conc. (mg/L) Rank Conc. (mg/L) | 2.21E-02  | 1.91E-01      | 1.23E-01     | 1.15E-01      | 1.11E-01        | 1.10E-01      | 9.18E-02      | 8.63E-02        | 8.37E-02         | 8.18E-02          | 7.24E-02         | 6.84E-02         | 6.72E-02     | 6.61E-02     | 6.32E-02         | 5.78E-02          | 3.09E-02      | 2.89E-02     | 2.49E-02                   | 2.18E-02      | 1.21E-02         | 1.14E-02         |
|      |                           | Rank                           |           | 14            | 1            | 12            | 3               | 10            | 16            | 20              | 5                | 15                | 11               | 9                | 2            | 17           | 13               | 6                 | 2             | 4            | 21                         | 8             | 18               | 19               |
| 1221 | 9-year Avg.               | Conc. (mg/L)                   | 3.93E-03  | 1.07E-02      | 1.19E-01     | 1.28E-02      | 8.37E-02        | 1.73E-02      | 8.61E-03      | 1.66E-03        | 5.09E-02         | 8.64E-03          | 1.72E-02         | 4.25E-02         | 9.35E-02     | 7.59E-03     | 1.07E-02         | 2.15E-02          | 2.70E-02      | 5.56E-02     | 1.66E-03                   | 2.66E-02      | 4.26E-03         | 4.25E-03         |
|      | Z-Well                    | (m)                            | 6.5       | 6.5           | 6.5          | 6.5           | 6.5             | 6.5           | 1.3           | 6.5             | 6.5              | 6.5               | 6.5              | 6.5              | 6.5          | 6.5          | 6.5              | 6.5               | 1.3           | 1.3          | 6.5                        | 1.3           | 1.3              | 1.3              |
|      | X-well Y- Well Z-Well     | (m)                            | 85.91     | 92.09         | 142.35       | 0.00          | 165.01          | 0.00          | 92'09         | 92.09           | 165.01           | 60.76             | 0.00             | 0.00             | 0.00         | 165.01       | 85.91            | 85.91             | 0.00          | 165.01       | 85.91                      | 85.91         | 85.91            | 85.91            |
|      | X-well                    | (m)                            | 430       | 102           | 102          | 430           | 430             | 102           | 102           | 102             | 430              | 102               | 430              | 430              | 430          | 430          | 430              | 430               | 430           | 430          | 430                        | 430           | 430              | 430              |
|      | Infil                     | (m/yr)                         | 0.17      | 0.46          | 0.17         | 0.46          | 0.17            | 0.17          | 0.17          | 0.17            | 0.17             | 0.17              | 0.17             | 0.17             | 0.17         | 0.46         | 0.46             | 0.46              | 0.17          | 0.17         | 0.17                       | 0.46          | 0.17             | 0.17             |
|      | Wst. Den                  | (g/cm3)                        | 1.2       | 1.2           | 1.2          | 1.2           | 1.2             | 1.2           | 1.2           | 1.2             | 1.2              | 1.2               | 1.2              | 1.2              | 1.2          | 1.2          | 1.2              | 1.2               | 1.2           | 1.2          | 1.2                        | 1.2           | 1.2              | 1.2              |
|      | <u>C</u> √ CI             | (L/kg)                         | 87.46     | 87.46         | 87.46        | 87.46         | 87.46           | 87.46         | 87.46         | 87.46           | 200.00           | 200.00            | 87.46            | 200.00           | 87.46        | 87.46        | 87.46            | 200.00            | 87.46         | 87.46        | 200.00                     | 87.46         | 87.46            | 200.00           |
|      | Wst Conc Cw / Cl Wst. Den | (mg/kg)                        | 43.73     | 43.73         | 43.73        | 43.73         | 43.73           | 43.73         | 43.73         | 43.73           | 100              | 100               | 43.73            | 100              | 43.73        | 43.73        | 43.73            | 100               | 43.73         | 43.73        | 100                        | 43.73         | 43.73            | 100              |
|      | TCLP                      | (mg/L)                         | 0.5       | 0.5           | 0.5          | 0.5           | 9.0             | 0.5           | 0.5           | 0.5             | 0.5              | 0.5               | 0.5              | 0.5              | 0.5          | 0.5          | 0.5              | 0.5               | 0.5           | 0.5          | 0.5                        | 0.5           | 0.5              | 0.5              |
|      | Depth Wst. Vol            | (m3)                           | 2214      | 2214          | 2214         | 2214          | 125000          | 2214          | 2214          | 125000          | 2214             | 2214              | 125000           | 2214             | 2214         | 2214         | 125000           | 2214              | 2214          | 2214         | 125000                     | 2214          | 125000           | 2214             |
|      | Depth                     | (m)                            | 5.6       | 2.6           | 2.6          | 5.6           | 2.6             | 2.6           | 2.6           | 2.6             | 2.6              | 2.6               | 2.6              | 2.6              | 2.6          | 2.6          | 2.6              | 2.6               | 2.6           | 2.6          | 2.6                        | 2.6           | 2.6              | 2.6              |
|      | Area                      | (m2)                           | 20200     | 20200         | 162000       | 20200         | 162000          | 20200         | 20200         | 20200           | 162000           | 20200             | 20200            | 20200            | 162000       | 162000       | 20200            | 20200             | 20200         | 162000       | 20200                      | 20200         | 20200            | 20200            |
|      | Two Parameters            | at High End                    | Base Case | Infil & Xwell | Area & Xwell | Yweli & Infil | Area & Wst. Vol | Ywell & Xwell | Xwell & Zwell | Xwell & Wst Vol | Area & Wst. Conc | Xwell & Wst. Conc | Ywell & Wst. Vol | Ywell & Wst Conc | Area & Ywell | Area & Infil | Infil & Wst. Vol | Infil & Wst. Conc | Ywell & Zwell | Area & Zwell | Wst. Vol & Wst. Conc 20200 | Infil & Zwell | Wst. Vol & Zwell | Wst Conc & Zwell |

Table A.53 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene -- Municipal Areas, 30 Year Active Life

| (m) (m3) 2.6 2214 2.6 12500 2.6 2214  | TCLP Wst Cond<br>(mg/L) (mg/kg)<br>1.49 43.73<br>1.49 100 | <del></del> | Wst. Den | E E  | 7      |        |     |             |     |          |                |
|---|---|-------------|----------|------|--------|--------|-----|-------------|-----|----------|----------------|
| tr. Conc. 60705 2.6 2214  st Vol 60705 2.6 2214  st Conc 60705 2.6 2214  tr. Vol 60705 2.6 2214  st Conc 60705 2.6 2214  tr. Vol 60705 2.6 2214  st Conc 60705 2.6 2214  tr. Vol 60705 2.6 2214  st Conc 60705 2.6 2214  tr. Conc 60705 2.6 2214  st Zwell 60705 2.6 2214   |   | _           | (a/cm3)  |      | Y-Well | Y-Well | Ň   | 9-year Avg. | 200 |          | 1              |
| tt Vol 60705 2.6 12500 tt Conc 60705 2.6 2214 st. Vol 60705 2.6 2214 st. Vol 60705 2.6 12500 tt. Vol 60705 2.6 12500 st. Vol 60705 2.6 12500 st. Vol 60705 2.6 12500 st. Vol 60705 2.6 2214 st Conc 60705 2.6 2214 tt. Vol 42088 2.6 2214 tt. Vol 60705 2.6 2214 tt. Vol 42088 2.6 2214 tt. Vol 60705 2.6 2214 tt. Vol 60705 2.6 2214 tt. Vol 42088 2.6 2214 tt. Vol 60705 2.6 2214 tt. Vol 60705 2.6 2214 st Conc 60705 2.6 2214 tt. Vol 60705 2.6 2214 tt. Vol 60705 2.6 2214 st Conc 60705 2.6 2214  |   | 29.35       | 12       | 0.17 | 430    | 117.75 | 6.5 | 3 93F-03    |     | 7 63F-02 | Yally<br>Vally |
| it. Conc 60705 2.6 2214 ell 60705 2.6 12500 st. Vol 60705 2.6 12500 st. Vol 60705 2.6 12500 st. Vol 60705 2.6 12500 ell 60705 2.6 12500 st. Vol 60705 2.6 2214 st. Conc 60705 2.6 2214 t. Vol 42088 2.6 2214 LP 60705 2.6 2214 T. Vol 60705 2.6 2214 conc 60705 2.6 2214 conc 60705 2.6 2214 T. Vol 60705 2.6 2214 El 60705 2.6 2214 T. Vol 60705 2.6 2214 T. Vol 60705 2.6 2214 T. Vol 60705 2.6 2214 T. Conc 60705 2.6 2214   | $\perp$   | 29.349      | 1.2      | 0.17 | 102    | 93.79  | 6.5 | 2.49E-02    | 22  | 4.59E-01 | -              |
| st. Vol 60705 2.6 2214 st. Vol 60705 2.6 12500 st. Vol 60705 2.6 12500 st. Vol 60705 2.6 12500 st. Vol 60705 2.6 2214 st. Conc 60705 2.6 2214 t. Vol 42088 2.6 2214 t. Vol 60705 2.6 2214 t. Vol 60705 2.6 2214 wst. Conc 60705 2.6 2214 wst. Conc 60705 2.6 2214 wst. Conc 60705 2.6 2214 st Conc 60705 2.6 2214 wst. Conc 60705 2.6 2214 conc 60705 2.6 2214 st Conc 60705 2.6 2214   |   | 67.11       | 1.2      | 0.17 | 102    | 93.79  | 6.5 | 2.53E-02    | 21  | 3.59E-01 | 2              |
| st. Vol 60705 2.6 12500  Vol 60705 2.6 12500  st. Vol 60705 2.6 12500  st. Vol 60705 2.6 12500  ell 60705 2.6 12500  ell 60705 2.6 2214  st Conc 60705 2.6 2214  t. Vol 42088 2.6 12500  Conc 60705 2.6 2214  t. Vol 60705 2.6 2214  Wst. Conc 60705 2.6 2214  Conc 60705 2.6 2214  LP 60705 2.6 2214  Wst. Conc 60705 2.6 2214  Conc 42088 2.6 2214  Swell 60705 2.6 2214  st Conc 42088 2.6 2214  st Conc 60705 2.6 2214  Swell 60705 2.6 2214  st Conc 60705 2.6 2214  | 4.2 43.73   | 10.41       | 1.2      | 0.17 | 102    | 93.79  | 6.5 | 6.40E-02    | 2   | 3.29E-01 | 3              |
| Vol         60705         2.6         2214           Vol         60705         2.6         12500           st. Vol         60705         2.6         12500           ell         60705         2.6         2214           st Conc         60705         2.6         2214           t. Vol         42088         2.6         2214           t. Vol         42088         2.6         2214           LP         60705         2.6         2214           LP         60705         2.6         2214           Wst. Conc         60705         2.6         2214           Wst. Conc         60705         2.6         2214           Conc         42088         2.6         2214           Mst. Conc         60705         2.6         2214           Conc         42088         2.6         2214           II         42088         2.6         2214           Swell         60705         2.6         2214           Swell         60705         2.6         2214           Swell         60705         2.6         2214           Swell         60705         2.6         2214       | 4.2 43.73   | 10.412      | 1.2      | 0.17 | 430    | 117.75 | 6.5 | 3.20E-02    | 16  | 3.10E-01 | 4              |
| Vol         60705         2.6         12500           st. Vol         60705         2.6         12500           ell         60705         2.6         2214           st Conc         60705         2.6         2214           t. Vol         42088         2.6         2214           t. Vol         42088         2.6         2214           t. Vol         60705         2.6         2214           LP         60705         2.6         2214           Wst. Conc         60705         2.6         2214           Wst. Conc         60705         2.6         2214           Conc         42088         2.6         2214           Mst. Conc         60705         2.6         2214           Conc         42088         2.6         2214           Mst. Gonc         42088         2.6         2214           Mst. Gonc         60705         2.6         2214           Mst. Gonc         42088         2.6         2214           Mst. Gonc         2.6         2214           Mst. Gonc         2.6         2214           Mst. Gonc         2.6         2214           Mst. | 1.49 43.73  | 29.35       | 1.2      | 0.46 | 102    | 93.79  | 6.5 | 7.33E-02    | 7   | 3.00E-01 | 5              |
| st. Vol 60705 2.6 12500 ell 60705 2.6 2214 ell 60705 2.6 2214 ell 60705 2.6 2214 elt Conc 60705 2.6 2214 t. Vol 42088 2.6 12500 Conc 60705 2.6 2214 elt Conc 60705 2.6 2214 Wst. Conc 60705 2.6 2214 Wst. Conc 60705 2.6 2214 Conc 42088 2.6 2214 elt 42088 2.6 2214 elt 60705 2.6 2214  | 1.49 43.73  | 29.349      | 1.2      | 0.46 | 430    | 117.75 | 6.5 | 3.11E-02    | 138 | 2.97E-01 | 9              |
| ell 60705 2.6 2214 st Conc 60705 2.6 2214 t. Vol 42088 2.6 12500 Conc 60705 2.6 2214 tt Vol 42088 2.6 12500 Conc 60705 2.6 2214 st Conc 60705 2.6 2214 Wst. Conc 60705 2.6 2214 Wst. Conc 60705 2.6 2214 Conc 42088 2.6 2214  Zwell 60705 2.6 2214 st Conc 42088 2.6 2214 Swell 60705 2.6 2214   | 1.49 43.73  | - 29.349    | 1.2      | 0.17 | 430    | 0.00   | 6.5 | 4.98E-02    | 14  | 2.74E-01 | 7              |
| sil 60705 2.6 2214 t. Vol 42088 2.6 12500 Conc 60705 2.6 2214 t. Vol 60705 2.6 2214 LP 60705 2.6 2214 LP 60705 2.6 2214 Wst. Conc 60705 2.6 2214 Wst. Conc 60705 2.6 2214 Conc 42088 2.6 2214 Il 42088 2.6 2214 Il 60705 2.6 2214 Swell 60705 2.6 2214 t. Zwell 60705 2.6 2214 t. Zwell 60705 2.6 2214  | 1.49 43.73  | 29.35       | 1.2      | 0.17 | 102    | 0.00   | 6.5 | 7.69E-02    | 9   | 2.66E-01 | 8              |
| t. Vol 42088 2.6 2214 Conc 60705 2.6 2214 Conc 60705 2.6 2214 LP 60705 2.6 2214 Wst. Conc 60705 2.6 2214 Wst. Conc 60705 2.6 2214 Conc 42088 2.6 2214  Zwell 60705 2.6 2214    42088 2.6 2214   42088 2.6 2214   60705 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214   42088 2.6 2214  | 1.49 43.73  | 29.35       | 1.2      | 0.17 | 102    | 93.79  | 1.3 | 3.65E-02    | 15  | 2.26E-01 | 6              |
| t. Vol 42088 2.6 12500  Conc 60705 2.6 2214  st Conc 60705 2.6 2214  LP 60705 2.6 2214  Wst. Conc 60705 2.6 2214  Wst. Conc 60705 2.6 2214  Conc 42088 2.6 2214  Zwell 60705 2.6 2214  Il 42088 2.6 2214  Il 60705 2.6 2214  Sill 60705 2.6 2214  Sill 60705 2.6 2214  Sill 60705 2.6 2214  Sill 60705 2.6 2214   | 1.49 100  | 67.11       | 1.2      | 0.17 | 430    | 0.00   | 6.5 | 5.09E-02    | 13  | 2.08E-01 | 9              |
| Conc         60705         2.6         2214           st Conc         60705         2.6         2214           LP         60705         2.6         2214           Wst. Conc         60705         2.6         12500           Wst. Conc         60705         2.6         2214           Conc         42088         2.6         2214           Zwell         60705         2.6         2214           II         42088         2.6         2214           III         42088         2.6         2214           III         60705         2.6         2214           SZwell         60705         2.6         2214           Correct         20705         2.6         2214   | 1.49 43.73  | 29.349      | 1.2      | 0.17 | 430    | 238.82 | 6.5 | 2.26E-01    | -   | 1.92E-01 | 1              |
| st Conc 60705 2.6 2214  LP 60705 2.6 2214  Wst. Conc 60705 2.6 12500  Wst. Conc 60705 2.6 2214  Conc 42088 2.6 2214  Zwell 60705 2.6 12500    42088 2.6 2214    42088 2.6 2214    42088 2.6 2214    50705 2.6 2214    50705 2.6 2214  | 1.49 100  | 67.11       | 1.2      | 0.46 | 430    | 117.75 | 6.5 | 3.08E-02    | 19  | 1.92E-01 | 12             |
| LP         60705         2.6         2214           Wst. Conc         60705         2.6         12500           Wst. Conc         60705         2.6         2214           Conc         420888         2.6         2214           Zwell         60705         2.6         12500           II         420888         2.6         12500           III         420888         2.6         2214           Sill         60705         2.6         2214           A Zwell         60705         2.6         2214           A Zwell         60705         2.6         2214   | 4.2 100   | 23.81       | 1.2      | 0.17 | 430    | 117.75 | 6.5 | 3.12E-02    | 17  | 1.88E-01 | 13             |
| Wst. Conc 60705 2.6 12500 60705 2.6 2214 60705 2.6 2214 2080 2.6 2214 2080 2.6 2214 2080 2.6 2214 60705 2.6 2214 60705 2.6 2214 60705 2.6 2214 60705 2.6 2214 60705 2.6 2214  | 4.2 43.73   | 10.41       | 1.2      | 0.17 | 430    | 0.00   | 6.5 | 1.23E-01    | 9   | 1.76E-01 | 14             |
| 60705 2.6 2214  | 1.49 100  | 67.11       | 1.2      | 0.17 | 430    | 117.75 | 6.5 | 1.15E-02    | 56  | 1.75E-01 | 15             |
| Conc   420888   2.6   2214  | 1.49 43.73  | 29.35       | 1.2      | 0.46 | 430    | 0.00   | 6.5 | 1.15E-01    | 4   | 1.49E-01 | 16             |
| Conc     42088     2.6     2214       Zwell     60705     2.6     12500       II     42088     2.6     2214       III     60705     2.6     2214       III     60705     2.6     2214       A Zwell     60705     2.6     2214  | 4.2 43.73   | 10.41       | 1.2      | 0.46 | 430    | 117.75 | 6.5 | 6.45E-02    | 6   | 1.17E-01 | 17             |
| Zwell         60705         2.6         12500           II         420888         2.6         2214           III         60705         2.6         2214           Same         60705         2.6         2214           Same         60705         2.6         2214   | 1.49 100  | 67.11       | 1.2      | 0.17 | 430    | 238.82 | 6.5 | 1.25E-01    | 2   | 9.20E-02 | 18             |
| II 420888 2.6 2214<br>SII 60705 2.6 2214<br>X Zwell 60705 2.6 2214  | 1.49 43.73  | 29.35       | 1.2      | 0.17 | 83     | 117.75 | 1.3 | 4.79E-03    | 78  | 7.59E-02 | 19             |
| Sil 60705 2.6 2214<br>2 Zwell 60705 2.6 2214  | 1:49 43.73  | 29.35       | 1.2      | 0.17 | 102    | 217.62 | 6.5 | 1.15E-01    | 2   | 7.48E-02 | 20             |
| . Zwell 60705 2.6 2214  | 1.49 43.73  | 29.35       | 1.2      | 0.17 | 430    | 0.00   | 1.3 | 2.25E-02    | 23  | 6.73E-02 | 21             |
| 7700 00 10000   | 1.49 100  | 67.11       | 1.2      | 0.17 | 430    | 117.75 | 1.3 | 4.86E-03    | 27  | 5.78E-02 | 22             |
| \$1.77 Q.7 CD/00  | 1,49 43.73  | 29.35       | 1.2      | 0.46 | 430    | 117.75 | 1.3 | 1.15E-02    | 25  | 5.04E-02 | 23             |
| 60705 2.6   | 4.2 43.73   | 10.41       | 1.2      | 0.17 | 430    | 117.75 | 1.3 | 1.18E-02    | 24  | 4.93E-02 | 24             |
| 420888 2.6 2214   | 1.49 43.73  | 29.35       | 1.2      | 0.17 | 430    | 0.00   | 6.5 | 6.66E-02    | 8   | 4.36E-02 | 25             |
| .Р 420888   |   | 10.41       | 1.2      | 0.17 | 430    | 238.82 | 6.5 | 6.35E-02    | 7   | 4.25E-02 | 56             |
| 420888 2.6 2214   | 1.49 43.73  | 29.35       | 1.2      | 0.46 | 430    | 238.82 | 6.5 | 5.46E-02    | 12  | 3.39E-02 | 27             |
| Area & Zwell 420888 2.6 2214 1.49   | 43.73   | 29.35       | 1.2      | 0.17 | 430    | 238.82 | 6.5 | 2.61E-02    | 50  | 2.57E-02 | 28             |

Table A.54 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene (TCLP = TC Regulatory Level) -- Municipal Areas (30 Year Active Life)

|                         |        |       |                     |        |                  | (a         | ,        |        |        |                       |        |              |        |            |       |
|-------------------------|--------|-------|---------------------|--------|------------------|------------|----------|--------|--------|-----------------------|--------|--------------|--------|------------|-------|
|                         |        |       |                     | -      |                  |            |          |        |        |                       |        | 1997         |        | 1998       |       |
| Two Parameters          | Area   | Depth | Depth Wst. Vol TCLP |        | Wst Conc Cw / Cl | CW/CI      | Wst. Den | Infil  | X-well | X-well Y- Well Z-Well | Z-Well | 9-vear Avo   |        | 9-vear Ava |       |
| at High End             | (m2)   | (m)   | (m3)                | (mg/L) | (mg/kg)          | (Lkg)      | (g/cm3)  | (m/yr) | Œ      | Œ                     | Œ      | Conc. (mg/L) | Rank   | _          | Rank  |
| Base Case               | 60705  | 2.6   | 2214                | 0.5    | 43.73            | 87.46      | 1.2      | 0.17   | 430    | 117 75                | 8.5    | 3 935-03     |        | A 33E 00   |       |
| Infil & Xwell           | 60705  | 2.6   | 2214                | 0.5    | 43.73            | 87.46      | 1.2      | 0.46   | 102    | 93 79                 | 6.5    | 1 07E-02     | 12     | 1 005 01   | -     |
| Xwell & Wst. Conc       | 60705  | 2.6   | 2214                | 0.5    | 100              | 200.00     | 1.2      | 0.17   | 102    | 93.79                 | 2 6    | 8 64E-03     | 1 4    | 1.39E-01   | -     |
| Xwell & Wst Vol         | 60705  | 2.6   | 125000              | 0.5    | 43.73            | 87.46      | 12       | 0.17   | 3      | 03.70                 | 2 2    | 1 REE 03     | 2 8    | 1.79E-01   | 7 (   |
| Ywell & Xwell           | 60705  | 2.6   | 2214                | 0.5    | 43.73            | 87.46      | 12       | 0.17   | 102    | 20.00                 | 0.0    | 1.00E-U3     | 3 5    | 1.61E-01   | 7)    |
| Infil & Wst. Vol        | 60705  | 2.6   | 125000              | 0.5    | 43 73            | 87 AG      | 12       | 0.46   | 100    | 447 75                | 3 6    | 1.7 JE-02    | 2      | 1.44E-01   | 4     |
| Xwell & Awell           | 80705  | 3.0   | 2044                | 2      | 2 5              | 2 5        | 7:1      | 0.40   | 55     | 11/./3                | 0.0    | 1.07E-02     | 13     | 1.34E-01   | 2     |
| Arca 8 18/24 1/-1       | 00/00  | 6.0   | 41.77               | 0.0    | 43.73            | 87.46      | 1.2      | 0.17   | 102    | 93.79                 | 1.3    | 8.61E-03     | 16     | 1.29E-01   | 9     |
| Aled & WSL. VO          | 420888 | 5.6   | 125000              | 0.5    | 43.73            | 87.46      | 1.2      | 0.17   | 430    | 238.82                | 6.5    | 8.37E-02     | 6      | 1.21E-01   | 7     |
| TWEIL & WST. VOI        | 60705  | 2.6   | 125000              | 0.5    | 43.73            | 87.46      | 1.2      | 0.17   | 430    | 0.00                  | 6.5    | 1.72E-02     | 7      | 1.09E-01   | 8     |
| infil & Wst. Conc       | 60705  | 2.6   | 2214                | 0.5    | 100              | 200.00     | 1.2      | 0.46   | 430    | 117.75                | 6.5    | 2.15E-02     | 6      | 1.07E-01   | 6     |
| Ywell & Infil           | 60705  | 2.6   | 2214                | 0.5    | 43.73            | 87.46      | 1.2      | 0.46   | 430    | 0.00                  | 6.5    | 1 28F-02     | 12     | 1 05E-01   | , ç   |
| Ywell & Wst Conc        | 60705  | 2.6   | 2214                | 0.5    | 9                | 200.00     | 1.2      | 0.17   | 430    | 000                   | 6.5    | 4 25E-02     | ! "    | 0 635 00   | 2 7   |
| Area & Wst. Conc        | 420888 | 2.6   | 2214                | 0.5    | 9                | 200.00     | 12       | 0 17   | 730    | 228 92                | 200    | F 00F 00     | ) ,    | 3.03E-02   | =     |
| Area & Xwell            | 420888 | 26    | 2214                | 7      | 1                | 07 46      | 1 0      | 3 6    | 3      | 70.007                | 0      | 5.U9E-U2     | ۵      | 7.35E-02   | 12    |
| Wet Vol 8 Wet Con 60705 | 20205  | 2 6   | 1,77                | 3 6    | 7                | و. /ه<br>ع | 7.1      | 0.1/   | -      | 217.62                | 6.5    | 1.19E-01     | _      | 6.86E-02   | 13    |
| Water Vol & Water Conc  | cn/00  | 9.7   | 125000              | 0.5    | 9                | 200.00     | 1.2      | 0.17   | 430    | 117.75                | 6.5    | 1.66E-03     | 21     | 6.57E-02   | 14    |
| Area & Ywell            | 420888 | 2.6   | 2214                | 0.5    | 43.73            | 87.46      | 1.2      | 0.17   | 430    | 0.00                  | 6.5    | 9.35E-02     | 2      | 4.05E-02   | 15    |
| Ywell & Zwell           | 60705  | 2.6   | 2214                | 0.5    | 43.73            | 87.46      | 1.2      | 0.17   | 430    | 0.00                  | 1.3    | 2.70E-02     | 1      | 3.81F-02   | 1 4   |
| Infil & Zwell           | 60705  | . 2.6 | 2214                | 0.5    | 43.73            | 87.46      | 1.2      | 0.46   | 430    | 117.75                | 1.3    | 2.66E-02     | . 0    | 3.53F-02   | 2 2   |
| Wst. Vol & Zwell        | 60705  | 5.6   | 125000              | 0.5    | 43.73            | 87.46      | 1.2      | 0.17   | 430    | 117.75                | 1.3    | 4 26F-03     | 18     | 3 00E-02   | 18    |
| Wst Conc & Zwell        | 60705  | 2.6   | 2214                | 0.5    | 9                | 200.00     | 1.2      | 0.17   | +      | 117.75                | 13     | 4 25F-03     | 5 6    | 2 B7E-02   | 5 6   |
| Area & Zwell            | 420888 | 2.6   | 2214                | 0.5    | 43.73            | 87.46      | 1.2      | 0.17   | +      | 238 82                | 13     | 5.56F-02     | : -    | 2.31E.02   | 2 8   |
| Area & Infil            | 420888 | 2.6   | 2214                | 0.5    | 43.73            | 87.46      | 12       | 0.46   | +      | 228 82                | 3 4    | 7 505 02     | - [    | 4.00E-02   | 3   3 |
|                         |        |       | 1                   |        | -                | !          | !        | }      | -      | 20.05                 |        | 7.386-03     | _<br>_ | 1.8/E-02   | - 77  |

Table A.55 .Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/Arsenic -- Industrial Areas, 30 Year Active Life

| Two Parameters         Area at High End (m2)         (m)         (r)           Base Case         20200         2.6         2.2           Xwell & Wst Vol         20200         2.6         12           Ywell & Wst. Vol         20200         2.6         12           Infil & Xwell         20200         2.6         12           Wst. Vol & Wst. Conc         20200         2.6         12           Xwell & Wst. Conc         20200         2.6         2           Ywell & Xwell         20200         2.6         2           TCLP & Wst. Vol         20200         2.6         2           TCLP & Wst. Vol         20200         2.6         2           TCLP & xwell         20200         2.6         2           Ywell & Wst. Vol         20200         2.6         2           Ywell & Wst. Conc         20200         2.6         2           Ywell & Wst. Vol         20200         2.6         2           Ywell & Wst. Conc         20200  | Wst. Vol (m3) (m3) (2214 12500 | (mg/L)<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71 | Wst Conc         Cw / Cl         Wst Den           (mg/kg)         (L/kg)         (g/cm3)           493.3         35.98         1.2           493.3         35.981         1.2           493.3         35.981         1.2           730         53.25         1.2           493.3         35.981         1.2           730         53.25         1.2           493.3         35.98         1.2           493.3         35.98         1.2           493.3         35.98         1.2           493.3         35.98         1.2 | Cw / Cil / C |     | infil<br>(m/yr) | X-well (m) | X-well Y- Well Z-Well (m) (m) | Z-Well | 9-year Avg.<br>Conc. (mg/L) | Dank | 9-year Avg.  | Rank |
|--|--|--|--|--|-----|-----------------|------------|-------------------------------|--------|-----------------------------|------|--------------|------|
| End (m2) (m)  20200 2.6  Vol 20200 2.6  Vol 20200 2.6  Vst. Conc 20200 2.6  Ol 20200 2.6  Ol 20200 2.6  I 20200 2.6  Vol 162000 2.6  Vol 20200 2.6  Conc 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  |  | 90L)   |  |  |     | (m/yr)          | (m)        | Œ                             | (      | Conc. (mg/L)                | 7200 | 1 0 mm/ 1 1  | Dank |
| Vol         20200         2.6           Vol         20200         2.6           Vol         20200         2.6           Vol         20200         2.6           Vst. Conc         20200         2.6           I         20200         2.6           I         20200         2.6           I         20200         2.6           I         20200         2.6           Vol         20200         2.6           Vol         162000         2.6           well         20200         2.6           onc         20200         2.6           conc         20200         2.6  |  | 13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71                             |  | 35.98<br>35.981<br>35.981<br>35.98<br>53.25<br>35.981<br>35.98   | 1.2 | 0.17            |            | , ,                           | (III)  | ,                           | אווא | Conc. (mg/L) | Nam  |
| Vol         20200         2.6           Vol         20200         2.6           Vol         20200         2.6           Vst. Conc         20200         2.6           Conc         20200         2.6           I         20200         2.6           Vol         20200         2.6           I         20200         2.6           I         20200         2.6           Conc         20200         2.6           Vol         162000         2.6           well         20200         2.6           conc         20200         2.6   |  | 13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71                             |  | 35.981<br>35.981<br>35.98<br>35.981<br>35.98   | 1.2 | :               | 430        | 85.91                         | 6.5    | 1.17E-02                    |      | 1.02E-02     |      |
| Vol         20200         2.6           Vst. Conc         20200         2.6           Vst. Conc         20200         2.6           Vst. Conc         20200         2.6           Conc         20200         2.6           Vol         20200         2.6           Conc         20200         2.6           Vol         20200         2.6           Vol         162000         2.6           well         20200         2.6           onc         20200         2.6           Conc         20200         2.6  |  | 13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71                                      |  | 35.981<br>35.98<br><b>53.25</b><br>35.981<br>35.98   | 1.2 | 0.17            | 102        | 60.76                         | 6.5    | 1.14E-01                    | 2    | 2.61E-01     | -    |
| Vst. Conc 20200 2.6  Vst. Conc 20200 2.6  Conc 20200 2.6  Conc 20200 2.6  Vol 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  Vol 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  Conc 20200 2.6  Conc 20200 2.6  Vol 162000 2.6  Conc 20200 2.6  Conc 20200 2.6  Conc 20200 2.6  |  | 13.71<br>13.71<br>13.71<br>13.71<br>13.71<br>13.71   |  | 35.98<br><b>53.25</b><br>35.981<br>35.98   |     | 0.17            | 430        | 0.00                          | 6.5    | 2.04E-01                    | -    | 1.64E-01     | 2    |
| Vst. Conc 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  Vol 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  Vol 20200 2.6  Vol 162000 2.6  veill 20200 2.6  veill 20200 2.6  Conc 20200 2.6  Vol 162000 2.6  Conc 20200 2.6  Vol 162000 2.6  Vol 20200 2.6  Vol 20200 2.6  Vol 20200 2.6  Vol 20200 2.6  |  | 13.71<br>13.71<br>13.71<br>13.71<br>34<br>34   |  | <b>53.25</b> 35.981 <b>53.25</b> 35.98   | 1.2 | 0.46            | 102        | 60.76                         | 6.5    | 6.62E-02                    | 7    | 9.08E-02     | ဗ    |
| Conc 20200 2.6  Conc 20200 2.6  Vol 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  Vol 16200 2.6  well 20200 2.6  onc 20200 2.6  Conc 20200 2.6  Total 20200 2.6  Conc 20200 2.6  |  | 13.71  |  | 35.981<br><b>53.25</b><br>35.98  | 1.2 | 0.17            | 430        | 85.91                         | 6.5    | 5.72E-02                    | 6    | 8.21E-02     | 4    |
| Conc 20200 2.6  20200 2.6  Vol 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  Vol 162000 2.6  well 20200 2.6  onc 20200 2.6  Conc 20200 2.6  Tozon 20200 2.6  Conc 20200 2.6  Conc 20200 2.6  Conc 20200 2.6  |  | 13.71<br>13.71<br>13.71<br>34<br>34  |  | <b>53.25</b><br>35.98  | 1.2 | 0.46            | 430        | 85.91                         | 6.5    | 7.63E-02                    | 4    | 7.20E-02     | 2    |
| 20200 2.6   202000 2.6   202 |  | 13.71<br>13.71<br>34<br>34   | 493.3<br>493.3   | 35.98  | 1.2 | 0.17            | 102        | 60.76                         | 6.5    | 4.47E-02                    | 12   | 7.06E-02     | 9    |
| Vol 20200 2.6  Vol 20200 2.6  Conc 20200 2.6  Vol 162000 2.6  Solution 20200 2.6  onc 20200 2.6  conc 20200 2.6  Conc 20200 2.6  Texture 20200 2.6  Texture 20200 2.6  Texture 20200 2.6  Texture 20200 2.6  |  | 34<br>34<br>34<br>34   | 493.3  |  | 1.2 | 0.17            | 102        | 0.00                          | 6.5    | 9.95E-02                    | က    | 6.77E-02     | 7    |
| Vol         20200         2.6           I         20200         2.6           Conc         20200         2.6           Vol         162000         2.6           well         20200         2.6           onc         20200         2.6           Conc         20200         2.6           Conc         20200         2.6           T6200         2.6         2.6   | <del>                                     </del>   | 34 34  |  | 35.98  | 1.2 | 0.17            | 102        | 92.09                         | 1.3    | 4.80E-02                    | =    | 5.88E-02     | 8    |
| 20200 2.6<br>  Conc 20200 2.6<br>  Vol 162000 2.6<br>  P 20200 2.6<br>  Zwell 20200 2.6<br>  Conc 20200 2.6<br>  Conc 20200 2.6  | <del></del>  | 34   | _  | 14.509   | 1.2 | 0.17            | 430        | 85.91                         | 6.5    | 6.00E-02                    | 80   | 5.76E-02     | 6    |
| Conc   20200   2.6   |  | 13.71  | 493.3  | 14.51  | 1.2 | 0.17            | 102        | 92.09                         | 6.5    | 3.29E-02                    | 13   | 4.79E-02     | 10   |
| Vol 162000 2.6 P 20200 2.6 Zwell 20200 2.6 Conc 20200 2.6 t Conc 20200 2.6   | I  |  | 730  | 53.25  | 1.2 | 0.17            | 430        | 0.00                          | 6.5    | 7.49E-02                    | 5    | 4.38E-02     | 11   |
| Zwell 20200 2.6  Zwell 20200 2.6  Conc 20200 2.6  t Conc 20200 2.6   |  | 13.71  | 493.3  | 35.981   | 1.2 | 0.17            | 430        | 165.01                        | 6.5    | 2.73E-02                    | 14   | 3.26E-02     | 12   |
| Zwell 20200 2.6<br>Conc 20200 2.6<br>t Conc 20200 2.6  | 2214   | 34   | 493.3  | 14.51  | 1.2 | 0.17            | 430        | 0.00                          | 6.5    | 5.38E-02                    | 10   | 2.97E-02     | 13   |
| Conc 20200 2.6<br>t Conc 20200 2.6   | 12500  | 13.71  | 493.3  | 35.98  | 1.2 | 0.17            | 430        | 85.91                         | 1.3    | 1.96E-02                    | 17   | 2.78E-02     | 14   |
| t Conc 20200 2.6   | 2214   | 13.71  | 730  | 53.25  | 1.2 | 0.46            | 430        | 85.91                         | 6.5    | 2.34E-02                    | 16   | 1.90E-02     | 15   |
| 162000 2.6   | 2214   | 34   | 730  | 21.47  | 1.2 | 0.17            | 430        | 85.91                         | 6.5    | 1.76E-02                    | 18   | 1.51E-02     | 16   |
|  | H  | 13.71  | 493.3  | 35.98  | 1.2 | 0.17            | 102        | 142.35                        | 6.5    | 9.76E-03                    | 20   | 1.50E-02     | 17   |
| Ywell & Zwell 20200 2.6 2.   | 2214   | 13.71  | 493.3  | 35.98  | 1.2 | 0.17            | 430        | 0.00                          | 1.3    | 2.45E-02                    | 15   | 1.49E-02     | 18   |
| Ywell & Infil 20200 2.6 2.   | 2214   | 13.71  | 493.3  | 35.98  | 1.2 | 0.46            | 430        | 0.00                          | 6.5    | 6.71E-02                    | 9    | 1.32E-02     | 19   |
| Infil & TCLP 20200 2.6 2.  | 2214   | 34   | 493.3  | 14.51  | 1.2 | 0.46            | 430        | 85.91                         | 6.5    | 1.61E-02                    | 19   | 1.28E-02     | 20   |
| 2.6  | <del> </del>   | 13.71  | 730  | 53.25  | 1.2 | 0.17            | 430        | 165.01                        | 6.5    | 7.16E-03                    | 77   | 8.54E-03     | 21   |
| Wst Conc & Zwell 20200 2.6 22  | 2214   | 13.71  | 730  | 53.25  | 1.2 | 0.17            | 430        | 85.91                         | 1.3    | 7.17E-03                    | 21   | 7.43E-03     | 22   |
| Area & Ywell 162000 2.6 22   | 2214   | 13.71  | 493.3  | 35.98  | 1.2 | 0.17            | 430        | 0.00                          | 6.5    | 5.25E-03                    | 24   | 7.01E-03     | 23   |
| Area & Infil 162000 2.6 22   |  | 13.71  | 493.3  | 35.98  | 1.2 | 0.46            | 430        | 165.01                        | 6.5    | 4.95E-03                    | 56   | 6.44E-03     | 24   |
| Infil & Zwell 20200 2.6 22   |  | 13.71  | 493.3  | 35.98  | 1.2 | 0.46            | $\vdash$   | 85.91                         | 1.3    | 6.66E-03                    | 23   | 5.96E-03     | 25   |
| Area & TCLP 162000 2.6 22  | 2214   | 34   | 493.3  | 14.51  | 1.2 | 0.17            | 430        | 165.01                        | 6.5    | 4.84E-03                    | 22   | 5.77E-03     | 26   |
| 2.6  |  | 34   |  | 14.51  | 1.2 | 0.17            | 430        | 85.91                         | 1.3    | 5.15E-03                    | 25   | 5.03E-03     | 27   |
| Area & Zwell 162000 2.6 22   | 2214   | 13.71  | 493.3  | 35.98  | 1.2 | 0.17            | 430        | 165.01                        | 1.3    | 2.11E-03                    | 28   | 3.10E-03     | 28   |

Table A.56 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/TC Capped Arsenic -- Industrial Areas

Rank က 9 2 13 ഗ ဖ œ O 4 18 8 9 21 22 Conc. (mg/L)|Rank|Conc. (mg/L)| 9-year Avg. 9.05E-02 2.26E-01 1.49E-01 6.94E-02 7.03E-02 6.99E-02 6.72E-02 5.83E-02 4.34E-02 3.25E-02 3.10E-02 2.52E-02 1.89E-02 1.50E-02 1.48E-02 8.54E-03 6.46E-03 5.96E-03 3.10E-03 7.36E-03 7.01E-03 4 ဖ 9 7 4 12 15 13 တ N ω S က 16 18 9 ဂ္ဂ 4 7 9-year Avg. 1997 6.30E-02 1.18E-01 5.92E-02 3.05E-02 5.28E-02 3.43E-02 8.29E-02 3.98E-02 6.04E-02 2.73E-02 6.36E-02 7.16E-03 1.14E-02 2.14E-02 4.95E-03 9.75E-03 2.13E-02 5.76E-03 5.25E-03 6.32E-03 2.11E-03 X-well Y- Well Z-Well 6.5 6.5 6.5 6.5 E 6.5 6.5 6.5 6.5 6.5 6.5 6.5 1.3 £. 6.5 6.5 1.3 6.5 6.5 6.5 <del>د</del>. <del>د</del>. 60.76 60.76 85.91 92.09 142.35 85.91 60.76 85.91 165.01 0.00 165.01 85.91 0.0 0.0 85.91 165.01 165.01 Œ 0.00 85.91 85.91 9.9 0.00 <del>4</del>30 102 430 102 430 430 102 102 E 102 83 430 430 430 430 102 430 430 430 430 430 430 430 (m/yr) 0.17 Wst Conc Cw / CI Wst. Den Infil 0.17 0.46 0.17 0.46 0.17 0.17 0.17 0.17 (30 Year Active Life) 0.17 0.17 0.46 0.17 0.46 0.46 0.17 0.17 0.17 0.46 0.17 0.17 0.17 (g/cm3) 1.2 1.2 1.2 1.2 7. 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 47 7. 12 1.2 1.2 1.2 1.2 1.2 (L/kg) 98.66 98.66 98.66 98.66 146.00 98.66 146.00 146.00 98.66 146.00 146.00 98.66 146.00 98.66 98.66 98.66 98.66 98.66 98.66 98.66 98.66 98.66 (mg/kg) 493.3 493.3 493.3 493.3 493.3 493.3 493.3 493.3 493.3 493.3 730 730 730 493.3 493.3 493.3 493.3 493.3 493.3 730 730 730 TCLP (mg/L) Ŋ S S Ŋ S 2 S S S, S S S S S, S S 2 2 ß S 2 S Wst. Vol 12500 12500 2214 12500 (m3) 2214 12500 2214 2214 2214 2214 12500 12500 2214 2214 2214 2214 2214 2214 2214 2214 2214 2214 Depth 2.6 Ξ 2.6 2.6 2.6 5.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 5.6 2.6 2.6 2.6 2.6 5.6 2.6 2.6 2.6 5.6 (m2) Area 20200 20200 20200 20200 20200 162000 20200 20200 20200 20200 20200 20200 162000 162000 162000 20200 20200 162000 20200 162000 20200 20200 Nst. Vol & Wst. Conc Two Parameters Kwell & Wst. Conc at High End well & Wst Conc Area & Wst. Conc well & Wst. Vol Nst Conc & Zwell Xwell & Wst Vol nfil & Wst. Conc Area & Wst. Vol Nst. Vol & Zwell nfil & Wst. Vol well & Xwell well & Zwell well & Zwell Area & Xwell Base Case Area & Ywell nfil & Xwell well & Infil Area & Zwell Infil & Zwell Area & Infil

Table A57 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/Arsenic -- Municipal Areas, 30 Year Active Life

| Rank           10   |                   |        |       |         |          |          |               |         |        |          |         | ſ              | 1997         |      | 1998       |      |
|--|-------------------|--------|-------|---------|----------|----------|---------------|---------|--------|----------|---------|----------------|--------------|------|------------|------|
| Nat. Conc.   Conc. | Two Parameters    | Area   | Denth | Wet Vol | 0 I      | Wet Conc | <u>ن</u><br>م | Wet Den | T T    | Y.w.     | Y. Well | Z.Well         | 9-year Ava   |      | Q-vear Ava | Ī    |
| Vol         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         6.5         1.17E-02         2           Vol         60705         2.6         12800         13.71         493.3         35.981         1.2         0.17         430         6.5         1.14E-01         2           Vext         60705         2.6         12800         13.71         493.3         35.981         1.2         0.17         430         1.14E-01         2           Vext         60705         2.6         12800         13.71         493.3         35.981         1.2         0.17         430         11.14E-01         2           Vol         60705         2.6         12800         13.71         730         53.28         1.2         0.17         430         1.14E-01         2           Vol         60705         2.6         12800         13.71         493.3         35.981         1.2         0.17         430         1.14E-01         2           Vol         60705         2.6         2214         13.71         493.3         35.981         1.2         0.17         430         11.75         6.5         1.  | at High End       | (m2)   | (E)   | m3)     | (mg/L)   | (mg/kg)  | (L/kg)        | (g/cm3) | (m/yr) | (E)      | (m)     | (m)            | Conc. (mg/L) | Rank | _          | Rank |
| Vol         667705         2.6         12800         13.71         483.3         35.881         1.2         0.17         402         63.79         6.5         1.14E-01         2           Vol         667705         2.6         12800         13.71         483.3         35.881         1.2         0.17         430         10.77         6.5         5.72E-02         9           Vol         60705         2.6         12800         13.71         433.3         35.881         1.2         0.17         430         117.76         6.5         5.72E-0.2         9           Vol         60705         2.6         2214         13.71         433.3         35.89         1.2         0.17         430         117.76         6.5         6.0E-02         4           Vol         60705         2.6         2214         13.71         483.3         35.89         1.2         0.17         400         6.5         5.0E-02         4           II         60705         2.6         2214         13.71         483.3         35.89         1.2         0.17         400         6.00         6.5         5.0E-02         7           II         430         12.2         0.4  | Base Case         | 90209  | - 2.6 | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.17   | 430      | 117.75  | 6.5            | 1.17E-02     |      | 8.24E-03   |      |
| Vol         60705         2.6         12800         1371         4833         35.981         1.2         0.17         430         0.00         6.5         2.04E-01         1           Vol         60705         2.6         12800         13.71         730         63.28         1.2         0.17         430         11.75         6.5         5.7EE-02         9           Conc         60705         2.6         2244         13.71         730         63.28         1.2         0.17         430         11.75         6.5         5.7EE-02         9           Vol         60705         2.6         2244         13.71         493.3         36.981         1.2         0.17         430         11.75         6.5         6.0E-02         9           Vol         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         11.75         6.5         6.0E-02         9           No         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         11.75         6.5         2.04E-02         1           Aso         2.2         2.2         <   | Xwell & Wst Vol   | 60705  | 2.6   | 12500   | 13.71    | 493.3    | 35.981        | 1.2     | 0.17   | 102      | 93.79   | 6.5            | 1.14E-01     | 2    | 1.77E-01   | -    |
| (b)         (c)         (c) <td>Ywell &amp; Wst. Vol</td> <td>90209</td> <td>2.6</td> <td>12500</td> <td>13.71</td> <td>493.3</td> <td>35.981</td> <td>1.2</td> <td>0.17</td> <td>430</td> <td>0.00</td> <td>6.5</td> <td>2.04E-01</td> <td>1</td> <td>8.27E-02</td> <td>2</td>  | Ywell & Wst. Vol  | 90209  | 2.6   | 12500   | 13.71    | 493.3    | 35.981        | 1.2     | 0.17   | 430      | 0.00    | 6.5            | 2.04E-01     | 1    | 8.27E-02   | 2    |
| Oncore         60705         2.6         12500         13.71         493.3         36.981         1.2         0.46         430         11.77         6.5         7.65E-02         4           Conc         60705         2.6         2214         13.71         730         63.26         1.2         0.17         430         11.77         6.5         6.0E-02         1.2           Vol         60705         2.6         1214         13.71         493.3         35.96         1.2         0.17         430         11.77         6.5         6.0E-02         1.2           II         60705         2.6         2214         13.71         493.3         35.96         1.2         0.17         430         1.3         480         1.2         0.17         430         1.3         495.2         1.2         0.17         430         1.2         0.17         430         430         1.2         0.17         430         1.0  |                   | 60705  | 2.6   | 12500   | 13.71    | 730      | 53.25         | 1.2     | 0.17   | 430      | 117.75  | 6.5            | 5.72E-02     | 6    | 6.86E-02   | က    |
| Conc         60705         2.6         2214         13.71         730         63.26         1.2         0.17         402         93.79         6.5         447E-02         1.2           Vol         60705         2.6         12500         34         493.3         14.509         1.2         0.17         400         17.75         6.5         6.0E-02         8           II         60705         2.6         2214         13.71         493.3         35.99         1.2         0.17         400         6.5         6.0E-02         7           III         60705         2.6         2214         13.71         493.3         35.99         1.2         0.17         400         6.76         6.2E-02         7           Mell         60705         2.6         12500         13.71         493.3         35.99         1.2         0.17         430         13.71         493.3         35.99         1.2         0.17         430         13.71         493.3         35.99         1.2         0.17         430         10.00         6.5         5.3E-02         1.1           Vol         2.0         2.214         13.71         493.3         35.99         1.2         0.17   | infil & Wst. Vol  | 60705  | 2.6   | 12500   | 13.71    | 493.3    | 35.981        | 1.2     | 0.46   | 430      | 117.75  | 6.5            | 7.63E-02     | 4    | 5.49E-02   | 4    |
| Vol         60705         2.6         12500         34         493.3         14.509         1.2         0.17         430         11.5         6.5         6.00E-02         8           II         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         102         217.62         6.5         6.00E-02         7           II         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         102         0.00         6.5         9.96E-02         7           II         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         102         0.00         6.5         9.96E-02         7           Ashell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         402         33.99         1.2         0.17         402         33.99         1.2         0.17         402         33.99         1.2         0.17         402         33.99         1.2         0.17         402         0.00         6.5         9.96E-02         1         1.2         0.17         402  | Xwell & Wst. Conc | 60705  | 2.6   | 2214    | 13.71    | 730      | 53.25         | 1.2     | 0.17   | 102      | 93.79   | 6.5            | 4.47E-02     | 12   | 4.65E-02   | 5    |
| 60705   2.6   2214   13.71   493.3   35.99   1.2   0.46   102   217.62   6.5   6.62E-0.2   7   1   1   1   1   1   1   1   1   1   | TCLP & Wst. Vol   | 60709  | 2.6   | 12500   | ಸ        | 493.3    | 14.509        | 1.2     | 0.17   | 430      | 117.75  | 6.5            | 6.00E-02     | 8    | 4.65E-02   | 9    |
| Head   | Infil & Xwell     | 60705  | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.46   | 102      | 217.62  | 6.5            | 6.62E-02     | 7    | 4.20E-02   | 7    |
| 1  | Ywell & Xwell     | 60705  | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.17   | 102      | 0.00    | 6.5            | 9.95E-02     | 3    | 3.42E-02   | æ    |
| Well         60705         2.6         2214         1371         493.3         35.98         1.2         0.17         402         93.79         1.3         4.80E-02         11           Well         60705         2.6         12500         1371         493.3         35.98         1.2         0.17         430         10.00         6.5         7.49E-02         17           Conc         60705         2.6         2214         13.71         730         53.26         1.2         0.17         430         0.00         6.5         7.49E-02         5           Vol         42088         2.6         1214         13.71         730         53.26         1.2         0.17         430         238.82         6.5         7.49E-02         1           Dorc         60705         2.6         2214         13.71         730         53.26         1.2         0.17         430         238.82         6.5         2.73E-02         1           Dorc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         0.00         6.5         5.3E-02         1.0           Conc         60705         2.6  | TCLP & xwell      | 60705  | 2.6   | 2214    | ಸ        | 493.3    | 14.51         | 1.2     | 0.17   | 102      | 93.79   | 6.5            | 3.29E-02     | 13   | 3.15E-02   | 6    |
| Well         60705         2.6         12500         13.71         493.3         35.98         1.2         0.17         430         117.75         1.3         1.96E-02         17           Conc         60705         2.6         2214         13.71         730         53.26         1.2         0.17         430         238.82         6.5         2.73E-02         14           Vol         42088         2.6         1214         13.71         730         53.26         1.2         0.17         430         238.82         6.5         2.73E-02         14           Conc         60705         2.6         2214         13.71         730         21.47         1.2         0.46         430         238.82         6.5         2.73E-02         14           Conc         60705         2.6         2214         13.71         730         21.47         1.2         0.46         430         238.82         6.5         2.73E-02         16           Conc         60706         2.6         2214         13.71         493.3         35.86         1.2         0.46         430         238.82         6.5         2.73E-02         16           Conc         2214         1  | Xwell & Zwell     | 60705  | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.17   | 102      | 93.79   | 1.3            | 4.80E-02     | 11   | 3.02E-02   | 9    |
| Conc         60705         2.6         2214         13.71         730         53.26         1.2         0.17         430         0.00         6.5         7.49E-02         5           Vol         420888         2.6         12500         13.71         493.3         35.981         1.2         0.17         430         238.82         6.5         2.73E-02         14           Donc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         5.38E-02         10           Conc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         5.38E-02         10           Conc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         177.75         6.5         1.7E-02         16           Conc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         117.75         1.3         1.6E-02         19           Zwell         60705   | Wst. Vol & Zwell  | 60705  | 2.6   | 12500   | 13.71    | 493.3    | 35.98         | 1.2     | 0.17   | 430      | 117.75  | 1.3            | 1.96E-02     | 17   | 2.35E-02   | 11   |
| Vol         420888         2.6         12500         13.71         493.3         35.981         1.2         0.17         430         238.82         6.5         2.73E-02         14           Donc         60705         2.6         2214         34.         493.3         14.51         1.2         0.17         430         238.82         6.5         5.38E-02         10           Conc         60705         2.6         2214         13.71         730         21.45         1.2         0.46         430         238.82         6.5         5.38E-02         10           Conc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         5.38E-02         10           Conc         60705         2.6         2214         13.71         493.3         14.57         1.2         0.46         430         17.75         6.5         5.71E-02         16           Acon         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         17.75         1.3         1.7E-02         16           Acon         2.214         <  | Ywell & Wst Conc  | 60705  | 2.6   | 2214    | 13.71    | 730      | 53.25         | 1.2     | 0.17   | 430      | 0.0     | 6.5            | 7.49E-02     | 5    | 2.17E-02   | 12   |
| Donc         60705         2.6         2214         34         493.3         1451         1.2         0.17         430         0.00         6.5         5.38E-02         10           Conc         60705         2.6         2214         13.71         730         53.25         1.2         0.46         430         238.82         6.5         5.34E-02         16           Conc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         6.71E-02         6           Conc         60705         2.6         2214         34         730         21.47         1.2         0.46         430         238.82         6.5         6.71E-02         6           Acolis         2.6         2214         34         493.3         35.98         1.2         0.47         430         17.75         6.5         1.7E-02         1.8           Acolis         2.6         2214         13.71         493.3         35.98         1.2         0.47         430         17.75         6.5         1.7E-02         1.9           Acolis         2.2         2214         13.71         493.3 <td>Area &amp; Wst. Vol</td> <td>420888</td> <td>2.6</td> <td>12500</td> <td>13.71</td> <td>493.3</td> <td>35.981</td> <td>1.2</td> <td>0.17</td> <td>430</td> <td>238.82</td> <td>6.5</td> <td>2.73E-02</td> <td>14</td> <td>1.75E-02</td> <td>13</td>  | Area & Wst. Vol   | 420888 | 2.6   | 12500   | 13.71    | 493.3    | 35.981        | 1.2     | 0.17   | 430      | 238.82  | 6.5            | 2.73E-02     | 14   | 1.75E-02   | 13   |
| Conc         60705         2.6         2214         13.71         730         53.25         1.2         0.46         430         238.82         6.5         2.34E-02         16           Conc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         0.00         6.5         6.71E-02         6           Conc         60705         2.6         2214         34         730         21.47         1.2         0.46         430         117.75         6.5         6.71E-02         6           Lowell         60705         2.6         2214         13.71         493.3         36.98         1.2         0.17         430         238.82         6.5         1.61E-02         18           Aswell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         13.77         1.3         245E-02         1.5           Conc         42088         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         13.75         1.3         6.6E-03         23         24           Conc         42088  | Ywell & TCLP      | 60705  | 2.6   | 2214    | ষ্ক      | 493.3    | 14.51         | 1.2     | 0.17   | 8        | 0.00    | 6.5            | 5.38E-02     | 9    | 1.47E-02   | 4    |
| Conc         60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         0.00         6.5         6.71E-02         6           Conc         60705         2.6         2214         34         730         21.47         1.2         0.17         430         238.82         6.5         1.71E-02         19           I         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         1.3         1.61E-02         19           Zwell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         17.75         6.5         1.6E-02         19           Conc         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         6.5         9.76E-03         19           Conc         42088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         7.16E-03         23           I         60705         2.6         2214         13.71 <td>infil &amp; Wst. Conc</td> <td>60705</td> <td>2.6</td> <td>2214</td> <td>13.71</td> <td>730</td> <td>53.25</td> <td>1.2</td> <td>0.46</td> <td>430</td> <td>238.82</td> <td>6.5</td> <td>2.34E-02</td> <td>16</td> <td>1.44E-02</td> <td>15</td>  | infil & Wst. Conc | 60705  | 2.6   | 2214    | 13.71    | 730      | 53.25         | 1.2     | 0.46   | 430      | 238.82  | 6.5            | 2.34E-02     | 16   | 1.44E-02   | 15   |
| Conc         60705         2.6         2214         34         730         21.47         1.2         0.17         430         238.82         6.5         1.76E-02         18           60705         2.6         2214         34         493.3         14.51         1.2         0.46         430         117.75         6.5         1.61E-02         19           Zwell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         117.75         1.3         2.45E-02         15           Zwell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         217.62         6.5         9.76E-03         15           Conc         420888         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         1.3         6.66E-03         23           Conc         420888         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         1.3         6.66E-03         23           420888         2.6         2214   | Ywell & Infil     | 60705  | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.46   | 430      | 0.00    | 6.5            | 6.71E-02     | 9    | 1.42E-02   | 91   |
| 60705         2.6         2214         34         493.3         14.51         1.2         0.46         430         117.75         6.5         1.6Fe-02         19           Zwell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         0.00         1.3         2.45E-02         15           Zwell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         17.75         1.3         7.17E-03         20           Conc         42088         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         1.3         6.6E-03         20           Conc         42088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         7.16E-03         23           1         60705         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         7.16E-03         23           420888         2.6         2214   | TCLP & Wst Conc   | 60705  | 2.6   | 2214    | ষ্ঠ      | 730      | 21.47         | 1.2     | 0.17   | 430      | 238.82  | 6.5            | 1.76E-02     | 18   | 1.22E-02   | 17   |
| Zwell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         1.3         2.45e-02         15           Zwell         60705         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         117.75         1.3         2.45e-02         15           Conc         420888         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         1.3         6.66e-03         23           Conc         42088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         6.5         9.76e-03         23           I         60705         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         7.16e-03         23           I         60705         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         5.16e-03         27           I         420888   | Infil & TCLP      | 60709  | 2.6   | 2214    | ষ্ঠ      | 493.3    | 14.51         | 1.2     | 0.46   | 8        | 117.75  | 6.5            | 1.61E-02     | 19   | 9.74E-03   | 92   |
| Zwell         60705         2.6         2214         13.71         493.3         56.26         1.2         0.17         430         17.75         1.3         7.17E-03         21           42088         2.6         2214         13.71         493.3         35.98         1.2         0.17         402         217.62         6.5         9.76E-03         20           Conc         42088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         7.16E-03         23           I         60705         2.6         2214         13.71         730         63.26         1.2         0.17         430         238.82         6.5         7.16E-03         23           I         60705         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         17.75         1.3         5.15E-03         24           42088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         4.94E-03         27           42088         2.6         2214         13.71         4  | Ywell & Zwell     | 60705  | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.17   | 83       | 0.00    | 1.3            | 2.45E-02     | 15   | 7.40E-03   | 92   |
| 42088         2.6         2214         13.71         493.3         35.98         1.2         0.17         102         217.62         6.5         6.5         9.76E-03         20           Conc         42088         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         1.3         6.66E-03         23           I         60705         2.6         2214         13.71         730         63.25         1.2         0.17         430         238.82         6.5         7.16E-03         25           I         60705         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         0.00         6.5         5.15E-03         25           42088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         0.00         6.5         5.25E-03         24           42088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         4.94E-03         27           42088         2.6         2214         13.71         493.3  | Wst Conc & Zwell  | 60705  | 2.6   | 2214    | 13.71    | 730      | 53.25         | 1.2     | 0.17   | 63       | 117.75  | 1.3            | 7.17E-03     | 21   | 6.19E-03   | ଯ    |
| 60705         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         1.3         6.66E-03         23           Conc         420888         2.6         2214         13.71         730         63.25         1.2         0.17         430         238.82         6.5         7.16E-03         22           4 2088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         1.3         5.15E-03         25           4 2088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         5.25E-03         24           4 2088         2.6         2214         13.71         493.3         14.51         1.2         0.17         430         238.82         6.5         4.84E-03         27           4 2088         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         4.95E-03         26           4 2088         2.6         2214         13.71         493.3         35.98         1.2         0.17  | Area & Xwell      | 420888 | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.17   | 195      | 217.62  | 6.5            | 9.76E-03     | 8    | 5.74E-03   | 21   |
| Conc         420888         2.6         2214         13.71         730         63.25         1.2         0.17         430         238.82         6.5         7.16E-03         22           1         60705         2.6         2214         34         493.3         14.51         1.2         0.17         430         117.75         1.3         5.15E-03         25           420888         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         6.5         5.25E-03         24           420888         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         4.95E-03         27           420888         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         4.95E-03         26           420888         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         6.5         4.95E-03         26   |                   | 60705  | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.46   | 430      | 238.82  | 1.3            | 6.66E-03     | 23   | 4.82E-03   | 22   |
| 420888         2.6         2214         34         493.3         14.51         1.2         0.17         430         117.75         1.3         5.15E-03         25           420888         2.6         2214         13.71         493.3         14.61         1.2         0.17         430         0.00         6.5         5.25E-03         24           420888         2.6         2214         13.71         493.3         14.61         1.2         0.17         430         238.82         6.5         4.84E-03         27           420888         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         4.95E-03         26           420888         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         6.5         2.11E-03         28   | Conc              | 420888 | 2.6   | 2214    | 13.71    | 730      | 53.25         | 1.2     | 0.17   | 430      | 238.82  | 6.5            | 7.16E-03     | ß    | 4.58E-03   | 23   |
| 420888         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         0.00         6.5         5.25E-03         24           2         420888         2.6         2214         34         493.3         14.61         1.2         0.17         430         238.82         6.5         4.84E-03         27           42088         2.6         2214         13.71         493.3         35.98         1.2         0.46         430         238.82         6.5         4.95E-03         26           42088         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         6.5         2.11E-03         28   | -                 | 60705  | 2.6   | 2214    | <b>%</b> | 493.3    | 14.51         | 1.2     | 0.17   | 430      | 117.75  | <del>1</del> 3 | 5.15E-03     | 55   | 4.18E-03   | 24   |
| 420888         2.6         2214         34         493.3         14.61         41.2         0.17         430         238.82         6.5         4.84E-03         27           420888         2.6         2214         13.71         493.3         36.98         1.2         0.46         430         238.82         6.5         4.95E-03         26           1         420888         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         6.5         2.11E-03         28  |                   | 420888 | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.17   | 430      | 0.00    | 6.5            | 5.25E-03     | 24   | 3.21E-03   | 52   |
| 420888         2.6         2214         13.71         493.3         35.98         1.2         0,46         430         238.82         6.5         4.95E-03         26           420888         2.6         2214         13.71         493.3         35.98         1.2         0.17         430         238.82         6.5         2.11E-03         28  |                   | 420888 | 5.6   | 2214    | 8        | 493.3    | 14.51         | , 1.2   | 0.17   | -        | 238.82  | 6.5            | 4.84E-03     | 27   | 3.10E-03   | 92   |
| 4 <u>2</u> 0888 2.6 2214 13.71 493.3 35.98 1.2 0.17 430 238.82 6.5 2.11E-03 28   |                   | 420888 | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.46   | $\vdash$ | 238.82  | 6.5            | 4.95E-03     | 56   | 2.91E-03   | 27   |
|  |                   | 420888 | 2.6   | 2214    | 13.71    | 493.3    | 35.98         | 1.2     | 0.17   |          | 238.82  | 6.5            | 2.11E-03     | 88   | 1.92E-03   | 28   |

Table A.58 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/TC Capped Arsenic -- Municipal Areas (30 Year Active Life)

|                      |        |       |                |        | (30 rear Active Life)     | ACIIVE       | riie)    |        |        |                       |         |                  |          |              |       |
|----------------------|--------|-------|----------------|--------|---------------------------|--------------|----------|--------|--------|-----------------------|---------|------------------|----------|--------------|-------|
| ř                    |        |       |                |        |                           | ,            |          |        |        |                       |         | 1997             |          | 1998         |       |
| I wo Parameters      | Area   | Depth | Depth Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | <u>S</u> \ C | Wst. Den | Infil  | X-well | X-well Y- Well Z-Well | Z-Well  | 9-year Avg.      |          | 9-vear Avg.  |       |
| at High End          | (m2)   | (m)   | (m3)           | (mg/L) | (mg/kg)                   | (L/kg)       | (g/cm3)  | (m/yr) | (E)    | ε                     | Ξ       | Conc. (mg/L)     | Rank     | Conc. (ma/L) | Rank  |
| Base Case            | 60705  | 2.6   | 2214           | 5      | 493.3                     | 98.66        | 1.2      | 0.17   | 430    | -                     | 6.5     | 1.03E-02         |          | 8 24F-03     |       |
| Xwell & Wst Vol      | 60705  | 2.6   | 12500          | 2      | 493.3                     | 98.66        | 1.2      | 0.17   | 102    | 93.79                 | 6.5     | 6.30E-02         | 4        | 1 73E-01     | -     |
| Ywell & Wst. Vol     | 60705  | 2.6   | 12500          | 5      | 493.3                     | 98.66        | 1.2      | 0.17   | 430    | 0.00                  | 6.5     | 1.18E-01         |          | 8 17E-02     | -     |
| Wst. Vol & Wst. Conc |        | 2.6   | 12500          | 5      | 730                       | 146.00       | 1.2      | 0.17   | 430    | 117.75                | 6.5     | 3.05E-02         | 10       | 6.68F-02     | 7 6   |
| Infil & Wst. Vol     | 60705  | 2.6   | 12500          | 5      | 493.3                     | 98.66        | 1.2      | 0.46   | 430    | 117.75                | 6.5     | 5.28E-02         | 2        | 5.48F-02     | , 4   |
| Xwell & Wst. Conc    | 60705  | 2.6   | 2214           | . 5    | 730                       | 146.00       | 1.2      | 0.17   | 102    | 93.79                 | 6.5     | 3.43E-02         | 6        | 4.64E-02     | . 3   |
| intil & Xwell        | 60705  | 2.6   | 2214           | 5      | 493.3                     | 98.66        | 1.2      | 0.46   | 102    | 93.79                 | 6.5     | 5.92E-02         | 9        | 4.20E-02     | 9     |
| Ywell & Xwell        | 60705  | 2.6   | 2214           | 5      | 493.3                     | 98.66        | 1.2      | 0.17   | 102    | 0.00                  | 6.5     | 8.29E-02         | 2        | 3.41E-02     | /     |
| Aweil & Zweil        | 60705  | 2.6   | 2214           | 2      | 493.3                     | 98.66        | 1.2      | 0.17   | 102    | 93.79                 | 1.3     | 3.98E-02         | 8        | 3.01E-02     | 8     |
| WSt. Vol & Zwell     | 60705  | 2.6   | 12500          | 5      | 493.3                     | 98.66        | 1.2      | 0.17   | 430    | 117.75                | 1.3     | 1.14E-02         | 14       | 2.32E-02     | 6     |
| Twell & WST Conc     | 60705  | 2.6   | 2214           | 2      | 730                       | 146.00       | 1.2      | 0.17   | 430    | 0.00                  | 6.5     | 6.04E-02         | 2        | 2.17E-02     | 9     |
| Area & Wst. Vol      | 420888 | 2.6   | 12500          | 5      | 493.3                     | 98.66        | 1.2      | 0.17   | 430    | 238.82                | 6.5     | 2.73E-02         | =        | 1.75E-02     | =     |
| iniii & Wst. Conc    | 60705  | 2.6   | 2214           | 5      | 730                       | 146.00       | 1.2      | 0.46   | 430    | 117.75                | 6.5     | 2.14E-02         | 12       | 1.44E-02     | 2     |
| Ywell & Infil        | 60705  | 2.6   | 2214           | 5      | 493.3                     | 98.66        | 1.2      | 0.46   | 430    | 0.00                  | 6.5     | 6.36E-02         | m        | 1.41E-02     | : E   |
| Ywell & Zwell        | 60705  | 2.6   | 2214           | 5      | 493.3                     | 99.66        | 1.2      | 0.17   | 430    | 0.00                  | 1.3     | 2.13E-02         | 13       | 7.40E-03     | 4     |
| Zweli                | 60705  | 2.6   | 2214           | 5      | 730                       | 146.00       | 1.2      | 0.17   | 430    | 117.75                | 1.3     | 5.76E-03         | 90       | 6.18E-03     | 22    |
|                      | 420888 | 5.6   | 2214           | 2      | 493.3                     | 98.66        | 1.2      | 0.17   | 102    | 217.62                | 6.5     | 9.75E-03         | 15       | 5 74F-03     | 9 4   |
| infil & Zwell        | 60705  | 2.6   | 2214           | ς.     | 493.3                     | 98.66        | 1.2      | 0.46   | 430    | 117.75                | 1.3     | 6.32E-03         | 1        | 4 87F-03     | 2   2 |
| Conc                 | 420888 | 2.6   | 2214           | S.     | 730                       | 146.00       | 1.2      | 0.17   | 430    | 238.82                | 6.5     | 7.16E-03         | 19       | 4.58E-03     | -   @ |
|                      | 420888 | 2.6   | 2214           | Ç.     | 493.3                     | 98.66        | 1.2      | 0.17   | 430    | 0.00                  | 6.5     | 5.25E-03         | 6        | 3.21E-03     | 2 0   |
|                      | 420888 | 5.6   | 2214           | Ω.     | 493.3                     | 99.86        | 1.2      | 0.46   | 430    | 238.82                | 6.5     | 4.95E-03         | 8        | 2.91E-03     | 2 8   |
| Area & Zwell         | 420888 | 2.6   | 2214           | 5.     | 493.3                     | 98.66        | 1.2      | 0.17   | 430    | 238.82                | 6.      | 2.11E-03         | 24       | 1 92E-03     | 3 5   |
|                      |        | 1     |                | 1      |                           | 1            | 1        | _      |        | -                     | <u></u> | -<br>}<br>!<br>! | <u>-</u> |              | - 7   |

Table A.59 Sensitivity Analysis for Unleaded Gasoline tank sediment Off-site Industrial Landfill Scenario/ Benzene (30 Year Active Life)

|                      | -            |          |          |      |                  |                  |          |                 |        |                |        |             |       |
|----------------------|--------------|----------|----------|------|------------------|------------------|----------|-----------------|--------|----------------|--------|-------------|-------|
| F                    |              | ;        |          |      |                  |                  |          |                 |        |                |        | 1998        |       |
| at High End          | Area<br>(m2) | De pth   | Wst. Vol | TCLP | Wst Conc Cw / Cl | ريد / ري<br>الإد | Wst. Den | Infil<br>(m/vr) | X-well | X-well Y- Well | Z-Well | 9-year Avg. | 2     |
| Base Case            | 20200        | 2.6      | 133.92   | 0.75 | 51.9             | 69.20            |          | 0.17            | 430    | 85.91          | 6.5    | 9 40E-03    | Vally |
| Xwell & Wst Vol      | 20200        | 2.6      | 1557.85  | 0.75 | 51.9             | 69.2             | 4.1      | 0.17            | 102    | 60.76          | 6.5    | 1.08E-01    | -     |
| Ywell & Wst. Vol     | 20200        | 2.6      | 1557.85  | 0.75 | 51.9             | 69.2             | 1.4      | 0.17            | 430    | 0.00           | 6.5    | 8.75E-02    | 2     |
| Infil & Wst. Vol     | 20200        | 2.6      | 1557.85  | 0.75 | 51.9             | 69.2             | 1.4      | 0.46            | 430    | 85.91          | 6.5    | 6.38E-02    | 3     |
| Area & Wst. Vol      | 162000       | 2.6      | 1557.85  | 0.75 | 51.9             | 69.2             | 1.4      | 0.17            | 430    | 165.01         | 6.5    | 6,17E-02    | 4     |
| Xwell & Wst. Conc    | 20200        |          | 133.92   | 0.75 | 110              | 146.67           | 1.4      | 0.17            | 102    | 92.09          | 6.5    | 6.01E-02    | 5     |
| Infil & Xwell        | 20200        |          | 133.92   | 0.75 | 51.9             | 69.20            | 1.4      | 0.46            | 102    | 60.76          | 6.5    | 5.58E-02    | 9     |
| TCLP & Wst. Vol      | 20200        | 2.6      | 1557.85  | 1.6  | 51.9             | 32.438           | 1.4      | 0.17            | 430    | 85.91          | 6.5    | 5.27E-02    | 7     |
| Ywell & Xwell        | 20200        | 2.6      | 133.92   | 0.75 | 51.9             | 69.20            | 1.4      | 0.17            | 102    | 0.00           | 6.5    | 5.23E-02    | 8     |
| Ywell & Wst Conc     | 20200        | 2.6      | 133.92   | 0.75 | 110              | 146.67           | 1.4      | 0.17            | 430    | 0.00           | 6.5    | 4.55E-02    | 6     |
| Xwell & Zwell        | 20200        | 2.6      | 133.92   | 0.75 | 51.9             | 69.20            | 4.1      | 0.17            | 102    | 92.09          | 1.3    | 4.42E-02    | 9     |
| TCLP & xwell         | 20200        | 2.6      | 133.92   | 1.6  | 51.9             | 32.44            | 1.4      | 0.17            | 102    | 92.09          | 6.5    | 4.18E-02    | =     |
| Wst. Vol & Wst. Conc | 20200        | 2.6      | 1657.85  | 0.75 | 110              | 146.67           | 4.1      | 0.17            | 430    | 85.91          | 6.5    | 3.43E-02    | 12    |
| Ywell & TCLP         | 20200        | 2.6      | 133.92   | 1.6  | 51.9             | 32.44            | 1.4      | 0.17            | 430    | 0.00           | 6.5    | 3.00E-02    | 13    |
| Ywell & Infil        | 20200        | 2.6      | 133.92   | 0.75 | 51.9             | 69.20            | 4.1      | 0.46            | 430    | 0.00           | 6.5    | 2.92E-02    | 14    |
| Infil & Wst. Conc    | 20200        | 2.6      | 133.92   | 0.75 |                  | 146.67           | 4.       | 0.46            | 430    | 85.91          | 6.5    | 2.39E-02    | 16    |
| Conc                 | 20200        | 2.6      | 133.92   | 1.6  | 110              | 68.75            | 4.1      | 0.17            | 430    | 85.91          | 6.5    | 1.99E-02    | 17    |
|                      | 162000       | 5.6      | 133.92   | 0.75 | 51.9             | 69.20            | 1.4      | 0.17            | 102    | 142.35         | 6.5    | 1.53E-02    | 19    |
|                      | 20200        | 2.6      | 1557.85  | 0.75 | 51.9             | 69.20            | 1.4      | 0.17            | 430    | 85.91          | 1.3    | 1.47E-02    | 8     |
| Conc                 | 162000       | 5.6      | 133.92   | 0.75 |                  | 146.67           | 1.4      | 0.17            | 430    | 165.01         | 6.5    | 1.35E-02    | 22    |
| Ywell & Zwell        | 20200        | 2.6      | 133.92   | 0.75 | 51.9             | 69.20            | 1.4      | 0.17            | 430    | 0.00           | 1.3    | 1.34E-02    | 23    |
|                      | 20200        | 2.6      | 133.92   | 1.6  | 51.9             | 32.44            | 4.1      | 0.46            | 430    | 85.91          | 6.5    | 1.27E-02    | 24    |
|                      | 162000       | 5.6      | 133.92   | 0.75 | 51.9             | 69.20            | 1.4      | 0.17            | 430    | 0.00           | 6.5    | 7.82E-03    | 92    |
| Zwell                | 20200        | 2.6      | 133.92   | 0.75 | H                | 146.67           | 4.1      | 0.17            | 62     | 85.91          | 1.3    | 7.64E-03    | 27    |
| ۵,                   | 162000       | 2.6      | 133.92   | 1.6  |                  | 32.44            | 1.4      | 0.17            | 430    | 165.01         | 6.5    | 6.49E-03    | 28    |
|                      | 162000       | 2.6      | 133.92   | 0.75 |                  | 69.20            | 1.4      | 0.46            | 430    | 165.01         | 6.5    | 6.33E-03    | 53    |
|                      | 20200        | 5.6      | 133.92   | 0.75 | 51.9             | 69.20            | 1.4      | 0.46            | -      | 85.91          | 1.3    | 5.59E-03    | ೫     |
|                      | 20200        | $\dashv$ | 133.92   | 9.1  |                  | 32.44            | 1.4      | 0.17            | 430    | 85.91          | 1.3    | 5.05E-03    | 33    |
| Area & Zwell         | 162000       | 5.6      | 133.92   | 0.75 | 51.9             | 69.20            | 1.4      | 0.17            | 430    | 165.01         | 6.5    | 3.41E-03    | 35    |

Table A.60 Sensitivity Analysis for Unleaded Gasoline tank sediment Off-site Industrial Landfill Scenario/TC Capped Benzene

Rank 2 12 ဖ 7 13 4 15 9 9 17 5 20 21 Conc. (mg/L) 9-year Avg. 8.46E-03 7.71E-02 6.28E-02 5.41E-02 5.33E-02 4.90E-02 4.85E-02 4.63E-02 3.90E-02 3.78E-02 2.84E-02 2.38E-02 2.16E-02 1.52E-02 1.33E-02 1.20E-02 1.05E-02 7.76E-03 6.34E-03 6.25E-03 5.38E-03 3.38E-03 X-well | Y- Well | Z-Well Ξ 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 <del>1</del>.3 6.5 6.5 6.5 6.5 6.5 <del>د</del>. <del>.</del>. 6.5 <del>ل</del> ن 6.5 <del>ر</del> ج <del>ر</del> ن 92.09 85.91 165.01 60.76 60.76 142.35 60.76 Ξ 0.00 85.91 85.91 0.00 0.00 0.00 85.91 165.01 165.01 85.91 165.01 0.00 85.91 85.91 0.00 430 Ξ 102 430 430 102 102 430 102 102 430 430 430 430 102 430 430 430 430 430 430 430 430 (m/yr) Infil 0.17 0.17 0.17 0.46 0.17 0.46 0.17 0.17 0.17 0.46 0.17 0.46 0.17 0.17 0.17 0.17 0.17 0.17 0.46 0.46 0.17 Wst Conc Cw / CI Wst. Den (g/cm3) 4. (30 Year Active Life) 4. 4. 4. 4. 4. 4. <u>4</u>. 4. 4. 4. 4. <u>4</u>. 4. 4. 4. 4. 4. (L/kg) 103.80 103.80 220.00 103.8 103.8 103.8 103.8 103.80 103.80 220.00 220.00 103.80 220.00 103.80 220.00 103.80 103.80 103.80 220.00 103.80 103.80 103.80 (mg/kg) 51.9 51.9 51.9 51.9 51.9 51.9 110 51.9 51.9 51.9 110 110 110 51.9 51.9 51.9 51.9 110 51.9 51.9 110 51.9 WSt. Vol TCLP (mg/L) 0.5 1557.85 1557.85 133.92 1557.85 1557.85 133.92 133.92 (m3) 133.92 133.92 133.92 133.92 1557.85 133.92 133.92 133.92 1557.85 133.92 133.92 133.92 133.92 133.92 133.92 Depth Ξ 2.6 5.6 5.6 5.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 5.6 2.6 2.6 5.6 5.6 2.6 5.6 5.6 2.6 2.6 162000 20200 Area 20200 (m<sub>2</sub>) 20200 20200 20200 20200 20200 20200 20200 20200 20200 162000 162000 20200 162000 162000 20200 20200 162000 20200 20200 Nst. Vol & Wst. Conc Two Parameters Kwell & Wst. Conc at High End well & Wst Conc Area & Wst. Conc well & Wst. Vol Area & Wst. Vol Xwell & Wst Vol nfil & Wst. Conc Nst Conc & Zwell Nst. Vol & Zwell nfil & Wst. Vol Ywell & Xwell Kwell & Zwell Base Case well & Zwell Area & Ywell Area & Xwell nfil & Xwell /well & Infil Area & Zwell nfil & Zwell Area & Infil

Table A.61 Sensitivity Analysis for Unleaded Gasoline tank sediment Off-site Municipal Landfill Scenario/ Benzene (30 Year Active Life)

|                      |        |       | _        |        |         | *1        |                  |        | , 77   |                       |                | 1998         | 15   |
|----------------------|--------|-------|----------|--------|---------|-----------|------------------|--------|--------|-----------------------|----------------|--------------|------|
| Two Parameters       | Area   | Depth | <u> </u> |        | _       | ઇ<br>/ જુ | Cw / Cl Wst. Den | Iufi   | X-well | X-well Y- Well Z-Well | Z-Well         | 9-year Avg.  |      |
| at High End          | (m2)   | Œ)    | (m3)     | (mg/L) | (mg/kg) | (L/kg)    | (g/cm3)          | (m/yr) | (E)    | Œ                     | Œ              | Conc. (mg/L) | Rank |
| Base Case            | 60705  | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 1.4              | 0.17   | 430    | 117.75                | 6.5            | 8.70E-03     |      |
| Xwell & Wst Vol      | 60705  | 2.6   | 1557.85  | 0.75   | 51.9    | 69.2      | 1.4              | 0.17   | 102    | 93.79                 | 6.5            | 1.70E-01     | -    |
| Ywell & Wst. Vol     | 60705  | 2.6   | 1557.85  | 0.75   | 51.9    | 69.2      | 1.4              | 0.17   | 430    | 0.00                  | 6.5            | 9.76E-02     | 2    |
| Infil & Wst. Vol     | 60705  | 5.6   | 1557.85  | 0.75   | 51.9    | 69.2      | 1.4              | 0.46   | 430    | 117.75                | 6.5            | 8.67E-02     | က    |
| TCLP & Wst. Vol      | 60705  | 2.6   | 1557.85  | 1.6    | 51.9    | 32.438    | 1.4              | 0.17   | 430    | 117.75                | 6.5            | 7.71E-02     | 4    |
| Wst. Vol & Wst. Conc | 60705  | 5.6   | 1557.85  | 0.75   | 110     | 146.67    | 1.4              | 0.17   | 430    | 117.75                | 6.5            | 7.17E-02     | 2    |
| nc                   | 60705  |       | 133.92   | 0.75   | 110     | 146.67    | 1.4              | 0.17   | 102    | 93.79                 | 6.5            | 5.84E-02     | 9    |
| Vol                  | 420888 |       | 1557.85  | 0.75   | 51.9    | 69.2      | 1.4              | 0.17   | 430    | 238.82                | 6.5            | 3.96E-02     | 7    |
| Ywell & Xwell        | 60705  | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 1.4              | 0.17   | 102    | 0.00                  | 6.5            | 3.22E-02     | 8    |
| Ywell & Wst Conc     | 60705  | 2.6   | 133.92   | 0.75   | 110     | 146.67    | 1.4              | 0.17   | 430    | 0.00                  | 6.5            | 3.12E-02     | 6    |
| TCLP & xwell         | 60705  | 2.6   | 133.92   | 1.6    | 51.9    | 32.44     | 1.4              | 0.17   | 102    | 93.79                 | 6.5            | 3.02E-02     | 9    |
| Infil & Xwell        | 60705  | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 4.1              | 0.46   | 102    | 93.79                 | 6.5            | 2.86E-02     | =    |
| Xwell & Zwell        | 60705  | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 4.1              | 0.17   | 102    | 93.79                 | 1.3            | 2.76E-02     | 12   |
| Wst. Vol & Zwell     | 60705  | 2.6   | 1557.85  | 0.75   | 51.9    | 69.20     | 1.4              | 0.17   | 430    | 117.75                | 1.3            | 2.71E-02     | 13   |
| Infil & Wst. Conc    | 60705  | 2.6   | 133.92   | 0.75   | 110     | 146.67    | 1.4              | 0.46   | 430    | 117.75                | 6.5            | 2.06E-02     | 4    |
| TCLP & Wst Conc      | 60705  | 2.6   | 133.92   | 1.6    | 110     | 68.75     | 1.4              | 0.17   | 430    | 117.75                | 6.5            | 1.85E-02     | 15   |
| Ywell & TCLP         | 60705  | 2.6   | 133.92   | 1.6    | 51.9    | 32.44     | 1.4              | 0.17   | 430    | 0.00                  | 6.5            | 1.58E-02     | 16   |
| Ywell & Infil        | 60705  | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 1.4              | 0.46   | 430    | 0.00                  | 6.5            | 1.39E-02     | 11   |
| Infil & TCLP         | 60705  | 2.6   | 133.92   | 1.6    | 51.9    | 32.44     | 1.4              | 0.46   | 430    | 117.75                | 6.5            | 9.91E-03     | 92   |
| Wst Conc & Zwell     | 60705  | 2.6   | 133.92   | 0.75   | 110     | 146.67    | 1.4              | 0.17   | 430    | 117.75                | 1.3            | 8.75E-03     | 19   |
|                      | 60705  | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 1.4              | 0.17   | 430    | 0.00                  | 1.3            | 7.73E-03     | 8    |
| Conc                 | 420888 |       | 133.92   | 0.75   | 110     | 146.67    | 1.4              | 0.17   | 430    | 238.82                | 6.5            | 7.47E-03     | 21   |
| =                    | 420888 | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 4.               | 0.17   | 102    | 217.62                | 6.5            | 6.29E-03     | 22   |
|                      | 60705  | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 4.1.4            | 0.46   | 430    | 117.75                | 1.3            | 4.69E-03     | 23   |
| _                    | 60705  | 5.6   | 133.92   | 1.6    | 51.9    | 32.44     | 1.4              | 0.17   | 430    | 117.75                | <del>د</del> . | 4.45E-03     | 24   |
|                      | 420888 | 5.6   | 133.92   | 0.75   | 51.9    | 69.20     | 1.4              | 0.17   | 430    | 0.00                  | 6.5            | 3.67E-03     | 25   |
| ۵,                   | 420888 | 2.6   | 133.92   | 1.6    | 51.9    | 32.44     | 1.4              | 0.17   | 430    | 238.82                | 6.5            | 3.55E-03     | 8    |
|                      | 420888 | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 1.4              | 0.46   | 430    | 238.82                | 6.5            | 2.83E-03     | 27   |
| Area & Zwell         | 420888 | 2.6   | 133.92   | 0.75   | 51.9    | 69.20     | 1.4              | 0.17   | 430    | 238.82                | 6.5            | 2.16E-03     | 88   |
|                      |        |       |          |        |         |           |                  |        |        |                       |                |              | 1    |

Table A.62 Sensitivity Analysis for Unleaded Gasoline tank sediment Off-site Municipal Landfill Scenario/TC Capped Benzene (30 Year Active Life)

|                      |        |       |          |        |                           |         |          |        |        |                       |        | 1998         |      |
|----------------------|--------|-------|----------|--------|---------------------------|---------|----------|--------|--------|-----------------------|--------|--------------|------|
| Two Parameters       | Area   | Depth | Wst. Vol | TCLP   | Wst Conc Cw / Cl Wst. Den | Cw / Cl | Wst. Den | T T    | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |      |
| at High End          | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg)                   | (L/kg)  | (g/cm3)  | (m/yr) | Œ      | (m)                   | Œ      | Conc. (mg/L) | Rank |
| Base Case            | 60705  | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.17   | 430    | 117.75                | 6.5    | 8.49E-03     |      |
| Xwell & Wst Vol      | 60705  | 2.6   | 1557.85  | 0.5    | 51.9                      | 103.8   | 1.4      | 0.17   | 102    | 93.79                 | 6.5    | 1.31E-01     | ~    |
| Ywell & Wst. Vol     | 60705  | 2.6   | 1557.85  | 0.5    | 51.9                      | 103.8   | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 7.66E-02     | 2    |
| Infil & Wst. Vol     | 60705  | 2.6   | 1557.85  | 0.5    | 51.9                      | 103.8   | 1.4      | 0.46   | 430    | 117.75                | 6.5    | 7.37E-02     | 3    |
| Xwell & Wst. Conc    | 60705  | 2.6   | 133.92   | 0.5    | 110                       | 220.00  | 1.4      | 0.17   | 102    | 93.79                 | 6.5    | 5.38E-02     | 4    |
| Wst. Vol & Wst. Conc | 60705  | 2.6   | 1557.85  | 0.5    | 110                       | 220.00  | 1.4      | 0.17   | 430    | 117.75                | 6.5    | 5.29E-02     | 5    |
| Area & Wst. Vol      | 420888 | 2.6   | 1557.85  | 0.5    | 51.9                      | 103.8   | 1.4      | 0.17   | 430    | 238.82                | 6.5    | 3.80E-02     | 9    |
| Ywell & Xwell        | 60705  | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.17   | 102    | 0.00                  | 6.5    | 3.12E-02     | 7    |
| Ywell & Wst Conc     | 60705  | 2.6   | 133.92   | 0.5    | 110                       | 220.00  | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 2.91E-02     | ω    |
| Infil & Xwell        | 60705  | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.46   | 102    | 93.79                 | 6.5    | 2.84E-02     | 6    |
| Xwell & Zwell        | 60705  | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 4.1      | 0.17   | 102    | 93.79                 | 1.3    | 2.67E-02     | 9    |
| Wst. Vol & Zwell     | 60705  | 2.6   | 1557.85  | 0.5    | 51.9                      | 103.80  | 1.4      | 0.17   | 430    | 117.75                | 1.3    | 2.13E-02     | 11   |
| Infil & Wst. Conc    | 60705  | 2.6   | 133.92   | 0.5    | 110                       | 220.00  | 1.4      | 0.46   | 430    | 117.75                | 6.5    | 2.02E-02     | 12   |
| Ywell & Infil        | 60705  | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.46   | 430    | 0.00                  | 6.5    | 1.39E-02     | 13   |
| Wst Conc & Zwell     | 60705  | 2.6   | 133.92   | 0.5    | 110                       | 220.00  | 1.4      | 0.17   | 430    | 117.75                | 1.3    | 8.16E-03     | 4    |
| Ywell & Zwell        | 60705  | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.17   | 430    | 0.00                  | 1.3    | 7.54E-03     | 15   |
| Area & Wst. Conc     | 420888 | 2.6   | 133.92   | 0.5    | 110                       | 220.00  | 1.4      | 0.17   | 430    | 238.82                | 6.5    | 7.40E-03     | 16   |
| Area & Xwell         | 420888 | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.17   | 102    | 217.62                | 6.5    | 6.24E-03     | 17   |
| infil & Zwell        | 60705  | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.46   | 430    | 117.75                | 1.3    | 4.63E-03     | 18   |
| Area & Ywell         | 420888 | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.17   | 430    | 0.00                  | 6.5    | 3.64E-03     | 19   |
|                      | 420888 | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.46   | 430    | 238.82                | 6.5    | 2.80E-03     | 20   |
| Area & Zwell         | 420888 | 2.6   | 133.92   | 0.5    | 51.9                      | 103.80  | 1.4      | 0.17   | 430    | 238.82                | 1.3    | 2.15E-03     | 21   |
|                      |        |       |          |        |                           |         |          |        |        |                       |        | -            |      |

Table A.63 Sensitivity Analysis for HF Alkylation Off-Site Landfill/Benzene -- Industrial Areas, 30 year Active Life

|                      |        |       |                |        |          |                |          |        |        |        |        | 1007         |      | 9000         |      |
|----------------------|--------|-------|----------------|--------|----------|----------------|----------|--------|--------|--------|--------|--------------|------|--------------|------|
| -                    |        |       | ,              |        |          | -              |          |        |        |        |        | 1661         |      | 0661         |      |
| Two Parameters       | Area   | Depth | Depth Wst. Vol | TCLP   | Wst Conc | ਹ<br>ਨੂੰ<br>ਹੈ | Wst. Den | Infil  | X-well | >      | Z-Well | 9-year Avg.  |      | 9-year Avg.  |      |
| at High End          | (m2)   | (m)   | (m3)           | (mg/L) | (mg/kg)  | (Ukg)          | (g/cm3)  | (m/yr) | (m)    | (m)    | (E)    | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| Base Case            | 20200  | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 430    | 85.91  | 6.5    | 6.42E-04     |      | 4.00E-03     |      |
| Area & Xwell         | 162000 | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 102    | 142.35 | 6.5    | 2.30E-02     | 2    | 3.92E-02     | -    |
| Area & TCLP          | 162000 | 2.6   | 36813.6        | 0.18   | 4.3      | 23.89          | 1.18     | 0.17   | 430    | 165.01 | 6.5    | 3.64E-02     | 2    | 3.78E-02     | 2    |
| Infil & Xwell        | 20200  | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.46   | 102    | 92.09  | 6.5    | 4.22E-03     | =    | 3.78E-02     | က    |
| Area & Infil         | 162000 | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.46   | 430    | 165.01 | 6.5    | 3.98E-02     | -    | 3.19E-02     | 4    |
| TCLP & xwell         | 20200  | 2.6   | 36813.6        | 0.18   | 4.3      | 23.89          | 1.18     | 0.17   | 102    | 60.76  | 6.5    | 2.84E-03     | 15   | 3.17E-02     | 2    |
| Ywell & TCLP         | -20200 | 2.6   | 36813.6        | 0.18   | 4.3      | 23.89          | 1.18     | 0.17   | 430    | 0.00   | 6.5    | 6.82E-04     | 24   | 2.62E-02     | 9    |
| Area & Ywell         | 162000 | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 430    | 0.00   | 6.5    | 2.26E-02     | 9    | 2.33E-02     | 7    |
| Infil & TCLP         | 20200  | 2.6   | 36813.6        | 0.18   | 4.3      | 23.89          | 1.18     | 0.46   | 430    | 85.91  | 6.5    | 6.81E-03     | 8    | 2.28E-02     | 8    |
| Ywell & Infil        | 20200  | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.46   | 430    | 0.00   | 6.5    | 1.27E-03     | 23   | 2.26E-02     | 6    |
| Area & Wst. Conc     | 162000 | 2.6   | 36813.6        | 0.076  | 14       | 184.21         | 1.18     | 0.17   | 430    | 165.01 | 6.5    | 3.02E-02     | 3    | 2.12E-02     | 9    |
| Area & Wst. Vol      | 162000 | 2.6   | 57371.3        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 430    | 165.01 | 6.5    | 2.43E-02     | 4    | 2.01E-02     | F    |
| Ywell & Xwell        | 20200  | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 102    | 0.00   | 6.5    | 2.79E-04     | 27   | 1.96E-02     | 12   |
| Xwell & Zwell        | 20200  | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 102    | 60.76  | 1.3    | 1.42E-03     | 22   | 1.63E-02     | 13   |
| Xwell & Wst. Conc    | 20200  | 2.6   | 36813.6        | 0.076  | 14       | 184.21         | 1.18     | 0.17   | 102    | 60.76  | 6.5    | 1.45E-03     | 21   | 1.36E-02     | 14   |
| Xwell & Wst Vol      | 20200  | 2.6   | 57371.3        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 102    | 60.76  | 6.5    | 1.48E-03     | 20   | 1.35E-02     | 15   |
| Ywell & Wst. Vol     | 20200  | 2.6   | 57371.3        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 430    | 0.00   | 6.5    | 6.11E-04     | 56   | 1.13E-02     | 16   |
| Ywell & Wst Conc     | 20200  | 2.6   | 36813.6        | 0.076  | 14       | 184.21         | 1.18     | 0.17   | 430    | 0.00   | 6.5    | 6.74E-04     | 25   | 1.07E-02     | 11   |
| Infil & Wst. Conc    | 20200  | 2.6   | 36813.6        | 0.076  | 14       | 184.21         | 1.18     | 0.46   | 430    | 85.91  | 6.5    | 6.35E-03     | 6    | 1.04E-02     | 9    |
| Infil & Wst. Vol     | 20200  | 2.6   | 57371.3        | 0.076  | 4.3      | 56.58          | 1.18     | 0.46   | 430    | 85.91  | 6.5    | 4.31E-03     | 9    | 1.03E-02     | 19   |
| Area & Zwell         | 162000 | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 430    | 165.01 | 6.5    | 8.69E-03     | 7    | 9.90E-03     | 8    |
| TCLP & Wst. Vol      | 20200  | 2.6   | 57371.3        | 0.18   | 4.3      | 23.89          | 1.18     | 0.17   | 430    | 85.91  | 6.5    | 2.90E-03     | 14   | 9.32E-03     | 21   |
| TCLP & Wst Conc      | 20200  | 2.6   | 36813.6        | 0.18   | 44       | 77.78          | 1.18     | 0.17   | 430    | 85.91  | 6.5    | 3.18E-03     | 13   | 9.27E-03     | 22   |
| Ywell & Zwell        | 20200  | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 430    | 0.00   | 1.3    | 2.73E-04     | 78   | 5.59E-03     | 23   |
| Infil & Zwell        | 20200  | 2.6   | 36813.6        | 0.076  | 4.3      | 56.58          | 1.18     | 0.46   | 430    | 85.91  | 1.3    | 3.88E-03     | 12   | 4.51E-03     | 54   |
| TCLP & Zwell         | 20200  | 2.6   | 36813.6        | 0.18   | 4.3      | 23.89          | 1.18     | 0.17   | 430    | 85.91  | 1.3    | 2.05E-03     | 16   | 4.39E-03     | 52   |
| Wst. Vol & Wst. Conc | 20200  | 2.6   | 57371.3        | 0.076  | 14       | 184.21         | 1.18     | 0.17   | 430    | 85.91  | 6.5    | 1.71E-03     | 82   | 3.99E-03     | 92   |
| Wst. Vol & Zwell     | 20200  | 2.6   | 57371.3        | 0.076  | 4.3      | 56.58          | 1.18     | 0.17   | 430    | 85.91  | 1.3    | 1.54E-03     | 19   | 1.90E-03     | 27   |
| Wst Conc & Zwell     | 20200  | 2.6   | 36813.6        | 0.076  | 14       | 184.21         | 1.18     | 0.17   | 430    | 85.91  | 1.3    | 1.74E-03     | 17   | 1.80E-03     | 88   |
|                      |        |       |                |        |          |                |          |        |        |        |        |              |      |              |      |

Table A.64 Sensitivity Analysis for HF Alkylation Off-Site Landfill/Benzene -- Municipal Areas, 30 Year Active Life

| Area         Depth         Wst. Vol         TCLP         Wst Conc           h End         (m2)         (m)         (m3)         (mg/L)         (mg/kg)           h End         (m2)         (m)         (m3)         (mg/L)         (mg/kg)           h End         60705         2.6         36813.6         0.076         4.3           h E0705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3   |      |          |  |              |        |          |         |          |        | _      |                       |        | /66L         |      | 1998         | -    |
|--|------|----------|--|--------------|--------|----------|---------|----------|--------|--------|-----------------------|--------|--------------|------|--------------|------|
| ind         (m2)         (m)         (mg/ls)         (mg/ls)           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           420888         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc   | _    |          | oth  ✓   | 7            |        | Wst Conc | Cw / Cl | Wst. Den | TE I   | X-well | X-well Y- Well Z-Well | Z-Well | 9-year Avg.  |      | 9-year Avg.  |      |
| 60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.078         4.3           60705         2.6         36813.6         0.078         4.3           60705         2.6         36813.6         0.078         4.3           42088         2.6         36813.6         0.078         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           nc         60705  |      | ji       | ا  | 11           | (mg/L) | (mg/kg)  | (L/kg)  | (g/cm3)  | (m/yr) | Ξ      | (m)                   | ε      | Conc. (mg/L) | Rank | Conc. (mg/L) | Rank |
| 60705         2.6         36813.6         0.18         4.3           60705         2.6         36813.6         0.076         4.3           42088         2.6         36813.6         0.076         4.3           42088         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3   |      | <u> </u> | -  | <sub>6</sub> | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 430    | 117.75                | 6.5    | 6.42E-04     |      | 9.91E-03     |      |
| 60705 2.6 36813.6 0.076 4.3 60705 2.6 36813.6 0.18 4.3 420888 2.6 36813.6 0.076 4.3 60705 2.6 36813.6 0.076 4.3 60705 2.6 36813.6 0.076 4.3 nnc 60705 2.6 36813.6 0.076 4.3  |      |          | <del>                                     </del> | 6813.6       | 0.18   | 4.3      | 23.89   | 1.18     | 0.17   | 102    | 93.79                 | 6.5    | 2.84E-03     | 15   | 6.36E-02     | -    |
| 60705         2.6         36813.6         0.18         4.3           42088         2.6         36813.6         0.18         4.3           42088         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         37371.3         0.076         4.3 <td></td> <td></td> <td></td> <td>9</td> <td>0.076</td> <td>4.3</td> <td>56.58</td> <td>1.18</td> <td>0.46</td> <td>102</td> <td>93.79</td> <td>6.5</td> <td>4.22E-03</td> <td>Ξ</td> <td>5.44E-02</td> <td>2</td>   |      |          |  | 9            | 0.076  | 4.3      | 56.58   | 1.18     | 0.46   | 102    | 93.79                 | 6.5    | 4.22E-03     | Ξ    | 5.44E-02     | 2    |
| 42088         2.6         36813.6         0.18         4.3           42088         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nc         420888         2.6         36813.6         0.076         4.3           nc         60705         2.6         37371.3         0.076  |      | L        | <del>                                     </del> | 6813.6       | 0.18   | 4.3      | 23.89   | 1.18     | 0.46   | 430    | 117.75                | 6.5    | 6.81E-03     | ω    | 4.62E-02     | က    |
| 42088         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.078         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nc         420888         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6   |      |          |  | 6813.6       | 0.18   | 4.3      | 23.89   | 1.18     | 0.17   | 430    | 238.82                | 6.5    | 3.64E-02     | 2    | 3.90E-02     | 4    |
| 60705         2.6         36813.6         0.18         4.3           60705         2.6         36813.6         0.076         4.3           nnc         60705         2.6         36813.6         0.076         4.3           nc         42088         2.6         36813.6         0.076         4.3           nc         42088         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6 <t< td=""><td></td><td></td><td><math>\vdash</math></td><td>9</td><td>0.076</td><td>4.3</td><td>56.58</td><td>1.18</td><td>0.17</td><td>102</td><td>217.62</td><td>6.5</td><td>2.30E-02</td><td>5</td><td>3.90E-02</td><td>2</td></t<>   |      |          | $\vdash$   | 9            | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 102    | 217.62                | 6.5    | 2.30E-02     | 5    | 3.90E-02     | 2    |
| 60705         2.6         36813.6         0.076         4.3           nrc         60705         2.6         36813.6         0.076         4.3           nrc         420888         2.6         36813.6         0.076         4.3           nc         420888         2.6         36813.6         0.076         4.3           nc         60705         2.6 <td< td=""><td></td><td></td><td>1</td><td>6813.6</td><td>0.18</td><td>4.3</td><td>23.89</td><td>1.18</td><td>0.17</td><td>430</td><td>0.00</td><td>6.5</td><td>6.82E-04</td><td>24</td><td>3.87E-02</td><td>9</td></td<>   |      |          | 1  | 6813.6       | 0.18   | 4.3      | 23.89   | 1.18     | 0.17   | 430    | 0.00                  | 6.5    | 6.82E-04     | 24   | 3.87E-02     | 9    |
| nnc         60705         2.6         36813.6         0.076         4.3           nnc         420888         2.6         36813.6         0.076         14           nc         420888         2.6         36813.6         0.076         4.3           420888         2.6         36813.6         0.076         4.3           1         420888         2.6         36813.6         0.076         4.3           1         420888         2.6         36813.6         0.076         4.3           1         420888         2.6         36813.6         0.076         4.3           1         60705         2.6         36813.6         0.076         4.3           1         60705         2.6         36813.6         0.076         4.3           1         60705         2.6         57371.3         0.076         4.3           1         60705         2.6         57371.3         0.076         4.3           1         60705         2.6         57371.3         0.076         4.3           1         60705         2.6         36813.6         0.076         4.3           2         60705         2.6         36813.   |      |          |  | (0           | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 102    | 0.00                  | 6.5    | 2.79E-04     | 27   | 3.15E-02     | 7    |
| nrc 60705 2.6 36813.6 0.076 144  nc 420888 2.6 36813.6 0.076 4.3  420888 2.6 36813.6 0.076 4.3  420888 2.6 36813.6 0.076 4.3  c 60705 2.6 36813.6 0.076 4.3  c 60705 2.6 36813.6 0.076 4.3  nc 60705 2.6 36813.6 0.076 4.3  c 60705 2.6 36813.6 0.076 4.3  |      | L        |  | 9            | 0.076  | 4.3      | 56.58   | 1.18     | 0.46   | 430    | 0.00                  | 6.5    | 1.27E-03     | 23   | 3.11E-02     | 8    |
| nc         420888         2.6         36813.6         0.076         14           60705         2.6         57371.3         0.076         4.3           420888         2.6         36813.6         0.076         4.3           1         420888         2.6         36813.6         0.076         4.3           5         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         57371.3         0.076         4.3           e0705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076   |      | l.       | <u> </u>   | 9            | 0.076  | 14       | 184.21  | 1.18     | 0.17   | 102    | 93.79                 | 6.5    | 1.45E-03     | 21   | 3.00E-02     | თ    |
| 60705 2.6 57371.3 0.076 4.3 420888 2.6 36813.6 0.076 4.3 1 420888 2.6 36813.6 0.076 4.3 1 420888 2.6 57371.3 0.076 4.3 1 60705 2.6 36813.6 0.076 4.3 1 60705 2.6 36813.6 0.18 14 14 1 60705 2.6 36813.6 0.18 4.3 1 60705 2.6 57371.3 0.076 4.3 1 60705 2.6 36813.6 0.076 4.3 1 60705 2.6 36813.6 0.076 4.3 2 60705 2.6 36813.6 0.076 4.3 2 60705 2.6 36813.6 0.076 4.3 2 60705 2.6 36813.6 0.076 4.3 2 60705 2.6 36813.6 0.076 4.3 2 60705 2.6 36813.6 0.076 4.3 2 60705 2.6 36813.6 0.076 4.3   | Conc | l        | _  | 9            | 0.076  | 44       | 184.21  | 1.18     | 0.17   | 430    | 238.82                | 6.5    | 3.02E-02     | က    | 2.95E-02     | 10   |
| 420888         2.6         36813.6         0.076         4.3           1         420888         2.6         36813.6         0.076         4.3           c         60705         2.6         36813.6         0.076         4.3           c         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         57371.3         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3           conc         60705         2.6 <t< td=""><td></td><td>L.,</td><td><del> </del></td><td></td><td>0.076</td><td>4.3</td><td>56.58</td><td>1.18</td><td>0.17</td><td>102</td><td>93.79</td><td>6.5</td><td>1.48E-03</td><td>82</td><td>2.89E-02</td><td>11</td></t<>   |      | L.,      | <del> </del>                                     |              | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 102    | 93.79                 | 6.5    | 1.48E-03     | 82   | 2.89E-02     | 11   |
| 60705         2.6         36813.6         0.076         4.3           1         42088         2.6         57371.3         0.076         4.3           c         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         57371.3         0.076         4.3           nc         60705         2.6         57371.3         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3   |      | <u> </u> | ·  | 6            | 0.076  | 4.3      | 56.58   | 1.18     | 0.46   | 430    | 238.82                | 6.5    | 3.98E-02     | -    | 2.76E-02     | 12   |
| 1         420888         2.6         67371.3         0.076         4.3           c         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.076         4.3           nc         60705         2.6         57371.3         0.076         4.3           nc         60705         2.6         57371.3         0.076         4.3           n         60705         2.6         57371.3         0.076         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3  |      | 1        |  | 1            | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 102    | 93.79                 | 1.3    | 1.42E-03     | 22   | 2.63E-02     | 13   |
| C         60705         2.6         36813.6         0.076         14           nc         42088         2.6         36813.6         0.076         4.3           nc         60705         2.6         57371.3         0.076         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3   |      | 1        |  | t.           | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 430    | 238.82                | 6.5    | 2.43E-02     | 4    | 2.59E-02     | 14   |
| nc         420888         2.6         36813.6         0.076         4.3           nc         60705         2.6         36813.6         0.18         14           60705         2.6         57371.3         0.076         4.3           nc         60705         2.6         57371.3         0.076         14           nc         60705         2.6         57371.3         0.076         4.3           nc         60705         2.6         57371.3         0.076         4.3           e0705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3           conc         60705         2.6         36813.6         0.076         4.3   |      |          | -  |              | 0.076  | 14       | 184.21  | 1.18     | 0.46   | 430    | 117.75                | 6.5    | 6.35E-03     | 6    | 2.44E-02     | 15   |
| nc         60705         2.6         36813.6         0.18         14           60705         2.6         57371.3         0.076         4.3           nc         60705         2.6         57371.3         0.076         14           n         60705         2.6         57371.3         0.076         4.3           42088         2.6         57371.3         0.076         4.3           60705         2.6         36813.6         0.076         4.3           Conc         60705         2.6         36813.6         0.076         4.3           Conc         60705         2.6         36813.6         0.076         4.3   |      |          |  | <u> </u>     | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 430    | 0.00                  | 6.5    | 2.26E-02     | 9    | 2.41E-02     | 16   |
| 60705 2.6   57371.3   0.076   4.3   0.076   6.0705   2.6   57371.3   0.18   4.3   0.076   4.3   0.076   2.6   36813.6   0.076   4.3   0.076   4.3   0.076   2.6   36813.6   0.076   4.3   0.076   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.0705   2.6   36813.6   0.076   4.3   0.076 | -    |          | -  | _            | 0.18   | 14       | 77.78   | 1.18     | 0.17   | 430    | 117.75                | 6.5    | 3.18E-03     | 13   | 2.39E-02     | 17   |
| ol         60705         2.6         67371.3         0.18         4.3           nc         60705         2.6         36813.6         0.076         14           nl         60705         2.6         57371.3         0.076         4.3           420888         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           Conc         60705         2.6         36813.6         0.076         4.3           Conc         60705         2.6         57371.3         0.076         4.3  |      |          | $\vdash$   |              | 0.076  | 4.3      | 56.58   | 1.18     | 0.46   | 430    | 117.75                | 6.5    | 4.31E-03     | 5    | 2.36E-02     | 18   |
| nc 60705 2.6 36813.6 0.076 14<br>42088 2.6 35371.3 0.076 4.3<br>60705 2.6 36813.6 0.18 4.3<br>60705 2.6 36813.6 0.076 4.3<br>Conc 60705 2.6 36813.6 0.076 4.3  |      |          | <del>                                     </del> | L            | 0.18   | 4.3      | 23.89   | 1.18     | 0.17   | 430    | 117.75                | 6.5    | 2.90E-03     | 14   | 2.26E-02     | 19   |
| II         60705         2.6         57371.3         0.076         4.3           42088         2.6         36813.6         0.076         4.3           60705         2.6         36813.6         0.076         4.3           Conc         60705         2.6         36813.6         0.076         4.3           Conc         60705         2.6         57371.3         0.076         14  |      | <u> </u> | $\vdash$   | 9            | 0.076  | 4        | 184.21  | 1.18     | 0.17   | 430    | 0.00                  | 6.5    | 6.74E-04     | 25   | 1.84E-02     | 8    |
| 420888     2.6     36813.6     0.076     4.3       60705     2.6     36813.6     0.18     4.3       Conc     60705     2.6     36813.6     0.076     4.3       Conc     60705     2.6     57371.3     0.076     14   |      |          |  |              | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 430    | 0.00                  | 6.5    | 6.11E-04     | 56   | 1.80E-02     | 21   |
| 60705 2.6 36813.6 0.18 4.3<br>60705 2.6 36813.6 0.076 4.3<br>Conc 60705 2.6 57371.3 0.076 14   |      |          | <u> </u>   | 100          | 9.0.0  | 4.3      | 56.58   | 1.18     | 0.17   | 430    | 238.82                | 6.5    | 8.69E-03     | 7    | 1.40E-02     | 22   |
| Conc 60705 2.6 36813.6 0.076 4.3 Conc 80705 2.6 <b>57371.3</b> 0.076 <b>14</b>   |      |          |  | (0           | 0.18   | 4.3      | 23.89   | 1.18     | 0.17   | 430    | 117.75                | 1.3    | 2.05E-03     | 16   | 1.07E-02     | 23   |
| Conc 60705 2.6 <b>57371.3</b> 0.076 <b>14</b>  | 209  |          |  |              | 0.076  | 4.3      | 56.58   | 1.18     | 0.46   | 430    | 117.75                | 1.3    | 3.88E-03     | 12   | 1.05E-02     | 24   |
|  | Conc |          |  | -            | 0.076  | 14       | 184.21  | 1.18     | 0.17   | 430    | 117.75                | 6.5    | 1.71E-03     | 18   | 1.03E-02     | 25   |
| 2.6 36813.6 0.076 4.3  |      |          |  | 3            | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 430    | 00.0                  | 1.3    | 2.73E-04     | 28   | 8.67E-03     | 26   |
| ell 60705 2.6 36813.6 0.076 <b>14</b>  | =    |          |  |              | 0.076  | 14       | 184.21  | 1.18     | 0.17   | 430    | 117.75                | 1.3    | 1.74E-03     | 17   | 5.07E-03     | 27   |
| Wst. Vol & Zwell 60705 2.6 57371.3 0.076 4.3 56.   |      |          |  | _            | 0.076  | 4.3      | 56.58   | 1.18     | 0.17   | 430    | 117.75                | 1.3    | 1.54E-03     | 19   | 4.96E-03     | 28   |

## APPENDIX B EXPOSURE DURATION SENSITIVITY

Table B.1 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene – Industrial Areas – Including Exposure Duration as a Parameter

|                       |        |          |          |                |                  |        |             |                   |                |       | 1996     |        | 1997        |         |
|-----------------------|--------|----------|----------|----------------|------------------|--------|-------------|-------------------|----------------|-------|----------|--------|-------------|---------|
| Two Parameters        | Area   | Depth    | Wst. Vol | TCLP           | Wst Conc Cw / Cl | Cw/Cl  | Infil       | X-well            | Y- Well Z-Well | Z-Wel | 9-year   |        | 9-vear Avg. |         |
| at High End           | . (m2) | (m)      | (m3)     | (mg/L)         | (mg/kg)          | (L/kg) | (m/yr)      | (m)               | (m)            | Ê     |          | Rank   |             | Rank    |
| Base Case             | 20200  | 2.6      | 2214     | 1.49           | 43.73            | 29.35  | 0.17        | 430               | 85.91          | 6.5   | 3.93E-03 | _      | 5.07E-02    |         |
| Infil & Xwell         | 20200  | 2.6      | 2214     | 1.49           | 43.73            | 29.35  | 0.46        | 102               | 92.09          | 6.5   | 7.33E-02 | ^      | 3.93E-01    | -       |
| TCLP & xwell          | 20200  | 2.6      | 2214     | 4.2            | 43.73            | 10.41  | 0.17        | 102               | 92.09          | 6.5   | 6.40E-02 | 2      | 3.37E-01    | 7       |
| Yweli & Xwell         | 20200  | 2.6      | 2214     | 1.49           | 43.73            | 29.35  | 0.17        | 102               | 0.00           | 6.5   | 7.69E-02 | ဖ      | 2.61E-01    | 6       |
| Ywell & TCLP          | 20200  | 2.6      | 2214     | 4.2            | 43.73            | 10.41  | 0.17        | 430               | 0.00           | 6.5   | 1.23E-01 | က      | 2.55E-01    | 4       |
| Xwell & Wst. Conc     | 20200  | 2.6      | 2214     | 1.49           | 100              | 67.11  | 0.17        | 102               | 60.76          | 6.5   | 2.53E-02 | 2      | 2.35E-01    | 3       |
| Area & Wst. Vol       | 162000 | 2.6      | 12500    | 1.49           | 43.73            | 29.349 | 0.17        | 430               | 165.01         | 6.5   | 2.26E-01 | L      | 2.30E-01    | 9       |
| Ywell & Infil         | 20200  | 2.6      | 2214     | 1.49           | 43.73            | 29.35  | 0.46        | 430               | 0.00           | 6.5   | 1.15E-01 | 4      | 2.23E-01    | ~       |
| Xwell & Wst Vol       | 20200  | 2.6      | 12500    | 1.49           | 43.73            | 29.349 | 0.17        | 102               | 92.09          | 6.5   | 2.49E-02 | 22     | 2.20E-01    | 80      |
| Xwell & Zwell         | 20200  | 2.6      | 2214     | 1.49           | 43.73            | 29.35  | 0.17        | 102               | 92.09          | 5.    | 3.65E-02 | 15     | 2.18E-01    | 6       |
| Ywell & Wst. Vol      | 20200  | 2.6      | 12500    | 1.49           | 43.73            | 29.349 | 0.17        | 430               | 0.00           | 6.5   | 4.98E-02 | 4      | 1.97E-01    | 2       |
| Ywell & Wst Conc      | 20200  | 5.6      | 2214     | 1.49           | 9                | 67.11  | 0.17        | 430               | 0.00           | 6.5   | 5.09E-02 | 13     | 1.78E-01    | =       |
| TCLP & Wst. Vol       | 20200  | l i      | 12500    | 4.2            | 43.73            | 10.412 | 0.17        | 430               | 85.91          | 6.5   | 3.20E-02 | 16     | 1.70E-01    | 12      |
| Area & Xwell          | 162000 |          | 2214     | 1.49           | 43.73            | 29.35  | 0.17        | 102               | 142.35         | 6.5   | 1.15E-01 | 2      | 1.68E-01    | 5       |
| Infil & Wst. Vol      | 20200  | 2.6      | 12500    | 1.49           | 43.73            | 29.349 | 0.46        | 430               | 85.91          | 6.5   | 3.11E-02 | 18     | 1.66E-01    | 4       |
| Area & Wst. Conc      | 162000 | 2.6      | 2214     | 1.49           | 100              | 67.11  | 0.17        | 430               | 165.01         | 6.5   | 1.25E-01 | 2      | 1.38E-01    | 15      |
| Infil & TCLP          | 20200  | 2.6      | 2214     | 4.2            | 43.73            | 10.41  | 0.46        | 430               | 85.91          | 6.5   | 6.45E-02 | 6      | 1.34E-01    | 19      |
| Infil & Wst. Conc     | 20200  | 2.6      | 2214     | 1.49           | 100              | 67.11  | 0.46        | 430               | 85.91          | 6.5   | 3.08E-02 | 19     | 1.34E-01    | 12      |
| TCLP & Wst Conc       | 20200  | 2.6      | 2214     | 4.2            | 100              | 23.81  | 0.17        | 430               | 85.91          | 6.5   | 3.12E-02 | 17     | 1.32E-01    | 82      |
| Exposure & Y-well     | 20200  | 2.6      | 2214     | 1.49           | 43.73            | 29.35  | 0.17        | 430               | 0.00           | 6.5   | ¥.       | ş      | 1.09E-01    | 6       |
| Area & Ywell          | 162000 | 2.6      | 2214     | 1.49           | 43.73            | 29.35  | 0.17        | 430               | 0.00           | 6.5   | 6.66E-02 | 8      | 8.77E-02    | ន       |
| Area & TCLP           | 162000 |          | 2214     | 4.2            | 43.73            | 10.41  | 0.17        | 430               | 165.01         | 6.5   | 6.35E-02 | 11     | 7.69E-02    | 2       |
| Area & Infil          | 162000 |          | 2214     | 1.49           | 43.73            | 29.35  | 0.46        | 430               | 165.01         | 6.5   | 5.46E-02 | 12     | 7.47E-02    | 22      |
| Wst. Vol & Wst. Conc  | 20200  | 2.6      | 12500    | 1.49           | 100              | 67.11  | 0.17        | 430               | 85.91          | 6.5   | 1.15E-02 | 56     | 7.31E-02    | ಜ       |
| rwell & Zwell         | 20200  | 2.6      | 2214     | 1.49           | 43.73            | 29.35  | 0.17        | 430               | 0.00           | 1.3   | 2.25E-02 | 23     | 7.13E-02    | 24      |
| Exposure & Wst. Vol.  | 20200  | 2.6      | 12500    | 1.49           | 43.73            | 29.35  | 0.17        | 430               | 85.91          | 6.5   | AN       | ¥      | 5.84E-02    | 52      |
| Exposure & TCLP       |        | 2.6      | 2214     | 4.2            | 43.73            | 10.41  | 0.17        | 430               | 85.91          | 8.5   | NA       | ž      | 5.54E-02    | 92      |
| Exposure & Wst. Conc. |        | 2.6      | 2214     | 1.49           | 100              | 67.11  | 0.17        | 430               | 85.91          | 6.5   | ¥.       | ¥      | 5.20E-02    | 27      |
| Exposure & Area       | 162000 | 2.6      | 2214     | 1.49           | 43.73            |        | 0.17        | _                 | 165.01         | 6.5   | AN       | Ϋ́     | 5.06E-02    | 28      |
| ICLP & Zwell          | 20200  | 2.6      | 2214     | 4.2            | 43.73            | -      | 0.17        | 430               | 85.91          | 1.3   | 1.18E-02 | 24     | 4.29E-02    | 29      |
| nni & zweii           | 20200  | 5.6      | 2214     | 1.49           | 43.73            | -1     | 0.46        | 430               | 85.91          | 1.3   | 1.15E-02 | 25     | 4.26E-02    | 30      |
| viea & Zwell          | 162000 | 0 0      | 2214     | - <del>6</del> | 43.73            | -      | 0.1         | 930               | 165.01         | 1.3   | 2.61E-02 | 20     | 3.80E-02    | <u></u> |
| Exposure & A-Well     | 20200  | 9.7      | 2214     | 1.49           | 43.73            | -      | 0.17        | 102               | 60.76          | 6.5   | Ϋ́       | ₹<br>Ž | 3.80E-02    | 32      |
| WSI. VOI & ZWEII      | 20202  | $\dashv$ | 2500     | 7.48           |                  | -      | )<br> -<br> | 054<br>05         | 16.59          | 1.3   | 4.79E-03 | 28     | 3.29E-02    | 8       |
| Wat Colic & Zwell     | 20200  | 0 2      | \$177    | 96.            | 300              | 67.71  | ) C O       | 08.<br>08.<br>68. | 85.91          | 1.3   | 4.86E-03 | 7      | 2.99E-02    | 34      |
| Exposure & Fillin     | 20202  | +        | 25.14    | 2 6            | +                | -+     | 9.40        | 3 6               | 83.8           | 0     | ¥        | ž      | 2.97E-02    | 3       |
| באחסחום מ ל-שבוו      | 40202  | -        | 41.77    | 64.            | 43.73            | 58.35  | )           | 35                | 83.81          | 2.    | ¥.       | ž      | 1.84E-02    | 8       |

Table B.2 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/ Benzene -- Municipal Landfills -- Including Exposure Duration as a Parameter

| lable B.2 Sensitivity | And 19818 | or nyo | roreming | 5      | במוחווו מ        | Certain       | 7      |        | 2      |        | Sensitivity Analysis for hydrorenning On-site Landin Scenario, Benzene - municipal Landins - moraning | Pincody | 5 ]      |              |
|-----------------------|-----------|--------|----------|--------|------------------|---------------|--------|--------|--------|--------|---|---------|----------|--------------|
|                       |           |        |          |        |                  |               |        |        |        |        | 1996  |         | 1997     |              |
| Two Parameters        | Area      | Depth  | Wst. Vol | TCLP   | Wat Conc Cw / Cl | <u>5</u><br>₹ | III    | X-well | ₹      | Z-Well |   |         |          |              |
| at High End           | (m2)      | E      | (m3)     | (mg/L) | (mg/kg)          | _             | (m/yr) | (E)    | (m)    | (m)    | -   | Rank    | 3        | Rank         |
| Base Case             | 60705     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 117.75 | 9'9    | 3.93E-03  |         | 7.63E-02 |              |
| Xwell & Wst Vol       | 60705     | 2.6    | 12500    | 1.49   | 43.73            | 29.349        | 0.17   | 102    | 93.79  | 6.5    | 2.49E-02  | 22      | 4.59E-01 | -            |
| Xwell & Wst. Conc     | 60705     | 5.6    | 2214     | 1.49   | <del>1</del> 0   | 67.11         | 0.17   | 102    | 93.79  | 6.5    | 2.53E-02  | 21      | 3.59E-01 | 2            |
| TCLP & xwell          | 60705     | 2.6    | 2214     | 4.2    | 43.73            | 10.41         | 0.17   | 102    | 93.79  | 6.5    | 6.40E-02  | 10      | 3.29E-01 | က            |
| TCLP & Wst. Vol       | 60705     | 2.6    | 12500    | 4.2    | 43.73            | 10.412        | 0.17   | 430    | 117.75 | 6.5    | 3.20E-02  | 16      | 3.10E-01 | 4            |
| Infil & Xwell         | 60705     | 26     | 2214     | 1.49   | 43.73            | 29.35         | 0.46   | 102    | 93.79  | 6.5    | 7.33E-02  | 7       | 3.00E-01 | 5            |
| Infil & Wst. Vol      | 60705     | 2.6    | 12500    | 1.49   | 43.73            | 29.349        | 0.46   | 430    | 117.75 | 6.5    | 3.11E-02  | 18      | 2.97E-01 | 9            |
| Ywell & Wst. Vol      | 60705     | 2.6    | 12500    | 1.49   | 43.73            | 29.349        | 0.17   | 430    | 0.00   | 6.5    | 4.98E-02  | 4       | 2.74E-01 | 7            |
| Ywell & Xwell         | 60709     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 102    | 0.00   | 6.5    | 7.69E-02  | 9       | 2.66E-01 | 8            |
| Xwell & Zwell         | 60705     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 102    | 93.79  | 1.3    | 3.65E-02  | 15      | 2.26E-01 | 6            |
| Ywell & Wst Conc      | 60705     | 2.6    | 2214     | 1.49   | 100              | 67.11         | 0.17   | 430    | 0.00   | 6.5    | 5.09E-02  | 13      | 2.08E-01 | 10           |
| Area & Wst. Vol       | 420888    | 2.6    | 12500    | 1.49   | 43.73            | 29.349        | 0.17   | 430    | 238.82 | 6.5    | 2.26E-01  | 1       | 1.92E-01 | 11           |
| Infil & Wst. Conc     | 60705     | 2.6    | 2214     | 1.49   | 100              | 67.11         | 0.46   | 430    | 117.75 | 6.5    | 3.08E-02  | 19      | 1.92E-01 | 12           |
| TCLP & Wst Conc       | 60705     | 2.6    | 2214     | 4.2    | 100              | 23.81         | 0.17   | 430    | 117.75 | 6.5    | 3.12E-02  | 17      | 1.88E-01 | 13           |
| Ywell & TCLP          | 60705     | 2.6    | 2214     | 4.2    | 43.73            | 10.41         | 0.17   | 430    | 0.00   | 6.5    | 1.23E-01  | 3       | 1.76E-01 | <del>,</del> |
| Wst. Vol-& Wst. Conc  | 60705     | 5.6    | 12500    | 1.49   | 100              | 67.11         | 0.17   | 430    | 117.75 | . 9.9  | 1.15E-02  | 26      | 1.75E-01 | 15           |
| Ywell & Infil         | 60705     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.46   | 430    | 0.00   | 6.5    | 1.15E-01  | 4       | 1.49E-01 | 16           |
| Exposure & Wst. Vol.  | 60705     | 2.6    | 12500    | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 117.75 | 9.9    | NA<br>NA  | ¥       | 1.43E-01 | 4            |
| Exposure & X-well     | 60705     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 102    | 93.79  | 6.5    | ¥   | ¥       | 1.40E-01 | 18           |
| Infil & TCLP          | 60705     | 5.6    | 2214     | 4.2    | 43.73            | 10.41         | 0.46   | 430    | 117.75 | 6.5    | 6.45E-02  | တ       | 1.17E-01 | 19           |
| Area & Wst. Conc      | 420888    | 2.6    | 2214     | 1.49   | 100              | 67.11         | 0.17   | 430    | 238.82 | 6.5    | 1.25E-01  | 2       | 9.20E-02 | 8            |
| Exposure & Wst. Conc. | 60705     | 2.6    | 2214     | 1.49   | 100              | 67.11         | 0.17   | 430    | 117.75 | 6.5    | ¥   | ≨       | 8.64E-02 | 21           |
| Exposure & Y-well     | 60705     | 5.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 0.00   | 6.5    | ¥   | ¥       | 8.55E-02 | 22           |
| Wst. Vol & Zwell      | 60705     | 2.6    | 12500    | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 117.75 | 1.3    | 4.79E-03  | 28      | 7.59E-02 | 23           |
| Area & Xwell          | 420888    | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 102    | 217.62 | 6.5    | 1.15E-01  | 5       | 7.48E-02 | 24           |
| Ywell & Zwell         | 60705     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 0.00   | 1.3    | 2.25E-02  | 23      | 6.73E-02 | 52           |
| Wst Conc & Zwell      | 60705     | 2.6    | 2214     | 1.49   | 100              | 67.11         | 0.17   | 430    | 117.75 |        | 4.86E-03  | 27      | 5.78E-02 | 56           |
| Exposure & TCLP       | 60705     | 2.6    | 2214     | 4.2    | 43.73            | 10.41         | 0.17   | 430    | 117.75 | 6.5    | ş   | ≨       | 5.29E-02 | 27           |
| Infil & Zwell         | 60705     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.46   | 430    | 117.75 | 1.3    | 1.15E-02  | 52      | 5.04E-02 | 28           |
| TCLP & Zwell          | 60705     | 2.6    | 2214     | 4.2    | 43.73            | 10.41         | 0.17   | 430    | 117.75 | 1.3    | 1.18E-02  | 22      | 4.93E-02 | 59           |
| Exposure & Infil      | 60705     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.46   | 430    | 117.75 | 6.5    | ¥   | ≨       | 4.74E-02 | ဗ္က          |
| Area & Ywell          | 420888    | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 0.00   | 6.5    | 6.66E-02  | 8       | 4.36E-02 | 8            |
| Area & TCLP           | 420888    | 2.6    | 2214     | 4.2    | 43.73            | 10.41         | 0.17   | 430    | 238.82 | 6.5    | 6.35E-02  | Ξ       | 4.25E-02 | 32           |
| Area & Infil          | 420888    | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.46   | 430    | 238.82 | 6.5    | 5.46E-02  | 12      | 3.39E-02 | 33           |
| Area & Zwell          | 420888    | 1 1    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 238.82 | _      | 2.61E-02  | 8       | 2.57E-02 | 8            |
| Exposure & Area       | 420888    | 1 1    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 238.82 |        | ₹   | ≨       | 2.42E-02 | 35           |
| Exposure & Z-well     | 60705     | 2.6    | 2214     | 1.49   | 43.73            | 29.35         | 0.17   | 430    | 117.75 | 1:3    | ¥   | ≨       | 2.36E-02 | 38           |
|                       |           |        |          |        |                  |               |        |        |        |        |   |         |          |              |

Table B.3 Sensitivity Analysis for Hydrorefining Off-site Landfill Scenario/Arsenic -- Industrial Areas -- including Exposure Duration as a Parameter

|                       | L      |       |          |        |          |          |      | Γ            |                |        | 1996        |      | 1997       | ſ    |
|-----------------------|--------|-------|----------|--------|----------|----------|------|--------------|----------------|--------|-------------|------|------------|------|
| Two Parameters        | Area   | Depth | Wst. Vol | TCLP   | Wst Conc | Cw/Cl    |      | Infil X-well | Y- Well Z-Well | Z-We!! | 9-vear Avg. |      | 9-vear Avo | I    |
| at High End           | (m2)   | (m)   | (m3)     | (mg/L) | (mg/kg)  | (L/kg)   | _    | Ê            | Œ              | (m)    | _           | Rank |            | Rank |
| Base Case             | 20200  | 2.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.17 | 83           | 85.91          | 6.5    | 1.17E-02    |      | 1.02E-02   |      |
| Xwell & Wst Vol       | 20200  | 2.6   | 12500    | 13,71  | 493.3    | 35.981   | 0.17 | 102          | 60.76          | 6.5    | 1.14E-01    | 2    | 2.61E-01   | -    |
| Ywell & Wst. Vol      | 20200  |       | 12500    | 13.71  | 493.3    | 35,981   | 0.17 | 430          | 0.00           | 6.5    | 2.04E-01    | -    | 1.64E-01   | 2    |
| Infil & Xwell         | 20200  | 2.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.46 | 102          | 60.76          | 6.5    | 6.62E-02    | 1    | 9.08E-02   | 6    |
| Wat Vol & Wst. Conc   | 20200  | 2.6   | 12500    | 13.71  | 730      | 53.25    | 0.17 | 430          | 85.91          | 6.5    | 5.72E-02    | ø    | 8.21E-02   | 4    |
| Infil & Wst. Vol      | 20200  | 2.6   | 12500    | 13.71  | 493.3    | 35.981   | 0.46 | 430          | 85.91          | 6.5    | 7.63E-02    | 4    | 7.20E-02   | 9    |
| Xwell & Wst. Conc     | 20200  | 5.6   | 2214     | 13.71  | 730      | 53.25    | 0.17 | 102          | 60.76          | 6.5    | 4.47E-02    | 12   | 7.06E-02   | 9    |
| Ywell & Xwell         | 20200  | 2.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.17 | 102          | 0.00           | 6.5    | 9.95E-02    | 3    | 6.77E-02   | ~    |
| Xwell & Zwell         | 20200  | 2.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.17 | 102          | 92.09          | 1.3    | 4.80E-02    | Ξ    | 5.88E-02   | 80   |
| TCLP & Wst. Vol       | 20200  | 2.6   | 12500    | 34     | 493.3    | 14.5088  | 0.17 | 430          | 85.91          | 6.5    | 6.00E-02    | 80   | 5.76E-02   | 6    |
| Exposure & Wst. Vol.  | 20200  | 2.6   | 12500    | 13.71  | 493.3    | 35.98    | 0.17 | 430          | 85.91          | 6.5    | Ϋ́          | ≨    | 5.66E-02   | 9    |
| TCLP & xwell          | 20200  | 2.6   | 2214     | 34     | 493.3    | 14.51    | 0.17 | 102          | 60.76          | 6.5    | 3.29E-02    | 13   | 4.79E-02   | =    |
| Exposure & X-well     | 20200  | 2.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.17 | 102          | 60.76          | 6.5    | .W          | ¥    | 4.78E-02   | 12   |
| Ywell & Wst Conc      | 20200  | 2.6   | 2214     | 13.71  | 730      | 63.25    | 0.17 | 85           | 0.00           | 6.5    | 7.49E-02    | 2    | 4.38E-02   | 5    |
| Area & Wst. Vol       | 162000 | 2.6   | 12500    | 13.71  | 493.3    | 35.981   | 0.17 | 430          | 165.01         | 6.5    | 2.73E-02    | 4    | 3.26E-02   | 4    |
| Ywell & Infil         | 20200  | 2.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.46 | 430          | 0.00           | 6.5    | 6.71E-02    | 9    | 3.12E-02   | 15   |
| Ywell & TCLP          | 20200  | 2.6   | 2214     | 34     | 493.3    | 14.51    | 0.17 | 430          | 0.00           | 6.5    | 5.38E-02    | 2    | 2.97E-02   | 16   |
| Exposure & Y-well     | 20200  | 5.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.17 | 430          | 0.00           | 6.5    | Ϋ́          | ¥    | 2.96E-02   | 4    |
| Wst. Vol & Zwell      | 20200  | 5.6   | 12500    | 13.71  | 493.3    | 35.98    | 0.17 | 430          | 85.91          | 1.3    | 1.96E-02    | 11   | 2.78E-02   | 22   |
| Infil & Wst. Conc     | 20200  | 2.6   | 2214     | 13.71  | 730      | 63.26    | 97.0 | 430          | 85.91          | 6.5    | 2.34E-02    | 16   | 1.90E-02   | 5    |
| TCLP & Wst Conc       | 20200  | 2.6   | 2214     | 34     | 730      | 21.47    | 0.17 | 430          | 85.91          | 6.5    | 1.76E-02    | 28   | 1.51E-02   | 2    |
| Exposure & Wst. Conc. | 20200  | 2.6   | 2214     | 13.71  | 730      | 53.25    | 0.17 | 430          | 85.91          | 6.5    | A'A         | Ϋ́   | 1.51E-02   | 21   |
| Area & Xwell          | 162000 | 5.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.17 | -            | 142.35         | 6.5    | 9.76E-03    | 8    | 1.50E-02   | 22   |
| Ywell & Zwell         | 20200  | 5.6   | 2214     | 13.71  | 493.3    | 35.98    | 0.17 | 430          | 0.00           | 1.3    | 2.45E-02    | 15   | 1.49E-02   | 23   |
| Infil & TCLP          | 20200  | 2.6   | -        | 34     | 493.3    | 14.61    | 0.46 | 430          | 85.91          | 6.5    | 1.61E-02    | 13   | 1.28E-02   | 24   |
| Exposure & Infil      | 20200  | 5.6   |          | 13.71  | 493.3    | 35.98    | 0.46 | 430          | 85.91          | 6.5    | Ą           | ¥    | 1.28E-02   | 52   |
|                       | 20200  | 5.6   | 2214     | 34     | 493.3    | 14.51    | 0.17 | 430          | 85.91          | 6.5    | AN          | ¥    | 1.02E-02   | 92   |
|                       | 162000 | 2.6   |          | 13.71  | 730      | 53.25    | 0.17 | 430          | 165.01         | 6.5    | 7.16E-03    | 22   | 8.54E-03   | 22   |
| Zweli                 | 20200  | 2.6   | -        | 13.71  | 730      | 53.26    | 0.17 | 430          | 85.91          | 1.3    | 7.17E-03    | 21   | 7.43E-03   | 88   |
| -                     | 162000 | 5.6   | -        | 13.71  | 493.3    | _        | 0.17 | -            | 0.00           | 6.5    | 5.25E-03    | 24   | 7.01E-03   | 53   |
|                       | 162000 | 2.6   | -        | 13.71  | 493.3    |          | 0.46 |              | 165.01         | 6.5    | 4.95E-03    | 56   | 6.46E-03   | 8    |
|                       | 20200  | 2.6   |          | 13.71  | 493.3    |          | 0.46 | 430          | 85.91          | 1.3    | 6.66E-03    | 23   | 5.96E-03   | 3    |
|                       | 162000 | 2.6   | 2214     | 34     | 493.3    | $\vdash$ | 0.17 | $\vdash$     | 165.01         | 6.5    | 4.84E-03    | 27   | 5.77E-03   | 32   |
| Area                  | 162000 | 2.6   | 2214     | 13.71  | 493.3    | -        | 0.17 | 430          | 165.01         | 6.5    | ΑN          | ¥    | 5.77E-03   | 33   |
| TCLP & Zwell          | 20200  | 2.6   | -        | 8      | 493.3    | Н        | 0.17 | Н            | 85.91          | 1.3    | 5.15E-03    | 25   | 5.03E-03   | 34   |
| z-well                | 20200  | 2.6   |          | 13.71  | -        | _        | 0.17 |              | 85.91          | 1.3    | NA<br>A     | ¥    | 5.02E-03   | 35   |
| Area & Zwell          | 162000 | 2.6   | 2214     | 13,71  | 493.3    | 35.98    | 0.17 | 430          | 165.01         | 6.5    | 2.11E-03    | 28   | 3.10E-03   | 98   |

Table B.4 Sensitivity Analysis for Hydrorefining Off-eite Landfill Scenario/Arsenic -- Municipal Areas -Including Exposure Duration as a Parameter

|                       |        |       |          |        |                       |         |        |        |               |        | 1996         |      | 1997            |      |
|-----------------------|--------|-------|----------|--------|-----------------------|---------|--------|--------|---------------|--------|--------------|------|-----------------|------|
| Two Parameters        | Area   | Depth | Wst. Vol |        | TCLP Wet Conc Cw / Cl | CW I CI | E E    | X-well | Y-Well Z-Well | Z-Well | 9-year Avg.  |      | 9-year Avg.     |      |
| at High End           | (m2)   | (m)   | (m3)     | (mg/L) | -                     | (U/kg)  | (m/yr) | (m)    | (m)           | (m)    | Conc. (mg/L) | Rank | Rank Well Conc. | Rank |
| Base Case             | 60705  | 5.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 430    | 117.75        | 6.5    | 1.17E-02     |      | 8.24E-03        |      |
| Xwell & Wst Vol       | 60705  | 5.6   | 12500    | 13.71  | 493.3                 | 35.981  | 0.17   | 102    | 93.79         | 6.5    | 1,14E-01     | 2    | 1,77E-01        | -    |
| Ywell & Wst. Vol      | 60705  | 2.6   | 12500    | 13.71  | 493.3                 | 35.981  | 0.17   | 430    | 0.00          | 6.5    | 2.04E-01     | -    | 8.27E-02        | 2    |
| Wst. Vol & Wst. Conc  | 60705  | 5.6   | 12500    | 13.71  | 730                   | 53.25   | 0.17   | 430    | 117.75        | 6.5    | 5.72E-02     | 6    | 6.86E-02        | 6    |
| Infil & Wst. Vol      | 60705  | 5.6   | 12500    | 13.71  | 493.3                 | 35.981  | 0.46   | 430    | 117.75        | 6.5    | 7.63E-02     | 4    | 5.49E-02        | 4    |
| Xwell & Wst. Conc     | 60705  | 2.6   | 2214     | 13.71  | 730                   | 53.25   | 0.17   | 102    | 93.79         | 6.5    | 4.47E-02     | 12   | 4.65E-02        | 2    |
| TCLP & Wst. Vol       | 60705  | 2.6   | 12500    | 34     | 493.3                 | 14.5088 | 0.17   | 430    | 117.75        | 6.5    | 6.00E-02     | 8    | 4.65E-02        | 9    |
| Exposure & Wst. Vol.  | 60705  | 2.6   | 12600    | 13.71  | 493.3                 | 35.98   | 0.17   | 430    | 117.75        | 6.5    | ΨX           | ž    | 4.64E-02        | 7    |
| Infil & Xwell         | 60709  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.46   | 102    | 93.79         | 6.5    | 6.62E-02     | 7    | 4.20E-02        | ھ    |
| Ywell & Xwell         | 60705  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 102    | 0.00          | 6.5    | 9.95E-02     | 3    | 3.42E-02        | 6    |
| TCLP & xwell          | 60705  | 2.6   | 2214     | 34     | 493.3                 | 14.51   | 0.17   | 102    | 93.79         | 6,5    | 3.29E-02     | 13   | 3.15E-02        | 5    |
| Exposure & X-well     | 60705  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 102    | 93.79         | 6.5    | ΑN           | ž    | 3.14E-02        | =    |
| Xwell & Zwell         | 60705  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 102    | 93.79         | 1.3    | 4.80E-02     | =    | 3.02E-02        | 12   |
| Wst. Vol & Zwell      | 60705  | 2.6   | 12500    | 13.71  | 493.3                 | 35.98   | 0.17   | 430    | 117.75        | 1.3    | 1.96E-02     | 12   | 2.35E-02        | 53   |
| Ywell & Wst Conc      | 60709  | . :   | 2214     | 13.71  | 730                   | 53.25   | 0.17   | 430    | 0.00          | 6.5    | 7.49E-02     | 2    | 2.17E-02        | 4    |
| Area & Wst. Vol       | 420888 | 2.6   | 12500    | 13.71  | 493.3                 | 35.981  | 0.17   | 430    | 238.82        | 6.5    | 2.73E-02     | 4    | 1.75E-02        | 15   |
| Ywell & TCLP          | 60705  | 5.6   | 2214     | 34     | 493.3                 | 14.51   | 0.17   | 430    | 0.00          | 6.5    | 5.38E-02     | 9    | 1.47E-02        | 16   |
| Expousre & Y-well     | 60705  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 430    | 0.00          | 6.5    | ΑN           | ž    | 1.46E-02        | 12   |
| Infil & Wst. Conc     | 60705  | 2.6   | 2214     | 13.71  | 730                   | 63.26   | 0.46   | 430    | 117.75        | 6.5    | 2.34E-02     | 16   | 1.44E-02        | 2    |
| Ywell & Infil         | 60705  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.46   | 430    | 0.00          | 6.5    | 6.71E-02     | 9    | 1.42E-02        | 19   |
| TCLP & Wst Conc       | 60705  | 2.6   | 2214     | 34     | 730                   | 21.47   | 0.17   | _      | 117.75        | 6.5    | 1.76E-02     | 18   | 1.22E-02        | 20   |
| Exposure & Wst. Conc. | 60705  | 2.6   | 2214     | 13.71  | 730                   | 63.25   | 0.17   | 430    | 117.75        | 6.5    | NA           | Ϋ́   | 1.22E-02        | 21   |
| Exposure & Infil      | 60705  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.46   | 430    | 117.75        | 6.5    | ΑN           | ž    | 9.76E-03        | 22   |
| Infil & TCLP          | 60705  | 2.6   | 2214     | 34     | 493.3                 | 14.51   | 0.46   | 430    | 117.75        | 6.5    | 1.61E-02     | 19   | 9.74E-03        | 23   |
| Expousie & TCLP       | 60705  | 2.6   | 2214     | 34     | 493.3                 | 14.51   | 0.17   |        | 117.75        | 6.5    | NA           | ¥    | 8.24E-03        | 54   |
| Ywell & Zwell         | 60709  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 430    | 0.00          | 1.3    | 2.45E-02     | 15   | 7.40E-03        | 25   |
| Wst Conc & Zwell      | 60709  | 2.6   | 2214     | 13.71  | 730                   | 53.25   | 0.17   |        | 117.75        | 1.3    | 7.17E-03     | 21   | 6.19E-03        | 56   |
| Area & Xwell          | 420888 | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   |        | 217.62        | 6.5    | 9.76E-03     | 20   | 5.74E-03        | 22   |
| Infil & Zwell         | 60709  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.46   | 430    | 117.75        | 1.3    | 6.66E-03     | 23   | 4.82E-03        | 28   |
| Area & Wst. Conc      | 420888 | 2.6   | 2214     | 13.71  | 730                   | 53.25   | 0.17   | 430    | 238.82        | 6.5    | 7.16E-03     | 22   | 4.58E-03        | 59   |
| TCLP & Zwell          | 60705  | 2.6   | 2214     | 34     | 493.3                 | 14.51   | 0.17   | _      | 117.75        | 1.3    | 5.15E-03     | 25   | 4.18E-03        | 30   |
| Expousre & Z-well     | 60705  | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 430    | 117.75        | 1.3    | NA           | ΑN   | 4.18E-03        | 31   |
|                       | 420888 | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   |        | 0.00          | 6.5    | 5.25E-03     | 24   | 3.21E-03        | 32   |
| Area & TCLP           | 420888 | 2.6   | 2214     | 34     | 493.3                 | 14.61   | 0.17   | 430    | 238.82        | 6.5    | 4.84E-03     | 27   | 3.10E-03        | ည    |
| Exposure & Area       | 420888 | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 430    | 238.82        | 6.5    | NA           | ΑN   | 3,10E-03        | 8    |
|                       | 420888 | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.46   |        | 238.82        | 6.5    | 4.95E-03     | 92   | 2.91E-03        | 35   |
| Area & Zwell          | 420888 | 2.6   | 2214     | 13.71  | 493.3                 | 35.98   | 0.17   | 430    | 238.82        | 6.5    | 2.11E-03     | 28   | 1.92E-03        | 36   |

Table B.5 Sensitivity Analysis for Unleaded Gasoline Tank Sludge Off-site Landfill Scenario/ Benzene -- Industrial Areas -- Including Exposure Duration as a Parameter

|                       |        |     |         |      |   |        | ľ      | ſ   |        |                                       | 1996          |      | 1997                                | Γ    |
|-----------------------|--------|-----|---------|------|---|--------|--------|-----|--------|---------------------------------------|---------------|------|-------------------------------------|------|
| i i                   |        |     | 17/4    |      | 7 |        | 9      | )   | 7      | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Deer And or o |      | Out acout                           | T    |
| at High End           | (m2)   | Ē   | (m3)    |      |   |        | (m/yr) | Ê   | E      | Œ                                     | Conc. (mg/L)  | Rank | Conc. (mg/L) Rank Conc. (mg/L) Rank | Rank |
| Base Case             | 20200  | 2.6 | 133.82  | 0.75 | 51.9                                    | 69.20  | 0.17   | 430 | 85.91  | 6.5                                   | 3.93E-03      |      | 9.40E-03                            |      |
| Xwell & Wst Vol       | 20200  | 2.6 | 1557.85 | 0.75 | 51.9                                    | 69.2   | 0.17   | 102 | 60.76  | 6.5                                   | 2.49E-02      | 22   | 1.08E-01                            | -    |
| Ywell & Wst. Vol      | 20200  | 2.6 | 1557.85 | 0.75 | 51.9                                    | 69.2   | 0.17   | 430 | 000    | 6.5                                   | 4.98E-02      | 14   | 8.75E-02                            | 2    |
| Infil & Wst. Vol      | 20200  | 2.6 | 1557.85 | 0.75 | 51.9                                    | 69.2   | 0.46   | 430 | 85.91  | 6.5                                   | 3.11E-02      | 18   | 6.38E-02                            | က    |
| Area & Wst. Vol       | 162000 | 2.6 | 1657.86 | 0.75 | 51.9                                    | 69.2   | 0.17   | 430 | 165.01 | 6.5                                   | 2.26E-01      | -    | 6.17E-02                            | 4    |
| Xwell & Wst. Conc     | 20200  | 2.6 | 133.92  | 0.75 | 110                                     | 146.67 | 0.17   | 102 | 60.76  | 6.5                                   | 2.53E-02      | 21   | 6.01E-02                            | 2    |
| infil & Xwell         | 20200  | 5.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.46   | 102 | 60.76  | 6.5                                   | 7.33E-02      | 7    | 5.58E-02                            | 9    |
| TCLP & Wst. Vol       | 20200  | 2.6 | 1557.85 | 1.6  | 51.9                                    | 32.438 | 0.17   | 430 | 85.91  | 6.5                                   | 3.20E-02      | 16   | 5.27E-02                            | 7    |
| Ywell & Xwell         | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 102 | 9,0    | 6.5                                   | 7.69E-02      | 9    | 5.23E-02                            | ဆ    |
| Ywell & Wst Conc      | 20200  | 2.6 | 133.92  | 0.75 | 110                                     | 146.67 | 0.17   | 430 | 0.00   | 6.5                                   | 5.09E-02      | 13   | 4.55E-02                            | 6    |
| Xwell & Zwell         | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 102 | 60.76  | 1.3                                   | 3.65E-02      | 15   | 4.42E-02                            | ę.   |
| TCLP & xwell          | 20200  | 2.6 | 133.92  | 1.6  | 51.9                                    | 32.44  | 0.17   | 102 | 60.76  | 6.5                                   | 6.40E-02      | 5    | 4.18E-02                            | Ξ    |
| Wst. Vol & Wst. Conc  | 20200  | 2.6 | 1557.85 | 0.75 | 110                                     | 146.67 | 0.17   | 83  | 85.91  | 6.5                                   | 1.15E-02      | 26   | 3.43E-02                            | 12   |
| Ywell & TCLP          | 20200  | 2.6 | 133.92  | 1.6  | 51.9                                    | 32.44  | 0.17   | 63  | 0.0    | 6.5                                   | 1.23E-01      | 3    | 3.00E-02                            | 13   |
| Ywell & Infil         | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.46   | 430 | 0.00   | 6.5                                   | 1.15E-01      | 4    | 2.92E-02                            | 4    |
| Exposure & Wst. Vol.  | 20200  | 2.6 | 1557.85 | 0.75 | 51.9                                    | 69.20  | 0.17   | 430 | 85.91  | 6.5                                   | NA            | NA   | 2.52E-02                            | 15   |
| Infil-&-Wst. Conc     | 20200  | 2.6 | 133.92  | 0.75 | 110                                     | 146.67 | 0.46   | 430 | 85.91  | 6.5                                   | 3.08E-02      | 19   | 2.39E-02                            | 16   |
| TCLP & Wst Conc       | 20200  | 2.6 | 133.92  | 1.6  | 110                                     | 68.75  | 0.17   | 430 | 85.91  | 6.5                                   | 3.12E-02      | 17   | 1.99E-02                            | 17   |
| Exposure & X-well     | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 102 | 92.09  | 6.5                                   | ΝA            | ΑN   | 1.77E-02                            | 18   |
| Area & Xwell          | 162000 | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 102 | 142.35 | 6.5                                   | 1.15E-01      | 2    | 1.53E-02                            | 19   |
| Wst. Vol & Zwell      | 20200  | 2.6 | 1557.85 | 0.75 | 51.9                                    | 69.20  | 0.17   | 430 | 85.91  | 1.3                                   | 4.79E-03      | 28   | 1.47E-02                            | 8    |
| Exposure & Y-well     | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 430 | 0.00   | 6.5                                   | NA            | ΑN   | 1.45E-02                            | 21   |
| Area & Wst. Conc      | 162000 | 2.6 | 133.92  | 0.75 | 110                                     | 146.67 | 0.17   | 430 | 165.01 | 6.5                                   | 1.25E-01      | 2    | 1.35E-02                            | 22   |
| Yweil & Zwell         | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 430 | 0.0    | 1.3                                   | 2.25E-02      | 23   | 1.34E-02                            | 23   |
| Infil & TCLP          | 20200  | 5.6 | 133.92  | 1.6  | 51.9                                    | 32.44  | 0,46   | 430 | 85.91  | 6.5                                   | 6.45E-02      | თ    | 1.27E-02                            | *    |
| Exposure & Wst. Conc. | 20200  | 5.6 | 133.92  | 0.75 | 110                                     | 146.67 | 0.17   | 430 | 85.91  | 6.5                                   | ΑN            | ž    | 9.84E-03                            | 52   |
| Area & Ywell          | 162000 | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 430 | 0.00   | 6.5                                   | 6.66E-02      | 80   | 7.82E-03                            | 56   |
| Wst Conc & Zwell      | 20200  | 5.6 | 133.92  | 0.75 | 110                                     | 146.67 | 0.17   | 430 | 85.91  | 1.3                                   | 4.86E-03      | 27   | 7.64E-03                            | 27   |
| Area & TCLP           | 162000 | 2.6 | 133.92  | 1.6  | 51.9                                    | 32.44  | 0.17   | 430 | 165.01 | 6.5                                   | 6.35E-02      | =    | 6.49E-03                            | 82   |
| Area & Infil          | 162000 | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.46   | 430 | 165.01 | 6.5                                   | 5.46E-02      | 12   | 6.33E-03                            | 53   |
| infil & Zwell         | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.46   | 430 | 85.91  | 1.3                                   | 1.15E-02      | 22   | 5.59E-03                            | 8    |
| Exposure & TCLP       | 20200  | 2.6 | 133.92  | 1.6  | 51.9                                    | 32.44  | 0.17   | 430 | 85.91  | 6.5                                   | NA            | ž    | 5.22E-03                            | 31   |
| TCLP & Zwell          | 20200  | 2.6 | 133.92  | 1.6  | 51.9                                    | 32.44  | 0.17   | 430 | 85.91  | 1.3                                   | 1.18E-02      | 24   | 5.05E-03                            | 32   |
| Exposure & Infil      | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.46   | 430 | 85.91  | 6.5                                   | NA            | ξ    | 5.02E-03                            | ន    |
| Exposure & Area       | 162000 | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 430 | 165.01 | 6.5                                   | ΝA            | ΑN   | 3.52E-03                            | 8    |
| Area & Zwell          | 162000 | 2.6 | 133.92  | 0.75 | 51.8                                    | 69.20  | 0.17   | 430 | 165.01 | 6.5                                   | 2.61E-02      | 20   | 3.41E-03                            | 35   |
| Exposure & Z-well     | 20200  | 2.6 | 133.92  | 0.75 | 51.9                                    | 69.20  | 0.17   | 430 | 85.91  | 1.3                                   | Y.            | ¥    | 2.44E-03                            | 98   |
|                       |        |     |         |      |   |        |        |     |        |                                       |               |      |                                     |      |

Table B.6 Sensitivity Analysis for Unleaded Gasoline Tank Sludge Off-site Landfill Scenario/ Benzene -- Municipal Areas -- Including Exposure Duration as a Parameter

|                       | _      | _        |          |        |                  |        |                |        |        |         |                       | 9861         |    | 7881              |      |
|-----------------------|--------|----------|----------|--------|------------------|--------|----------------|--------|--------|---------|-----------------------|--------------|----|-------------------|------|
| Two Parameters        | Area   | Depth    | Wst. Vol |        | Wat Conc Cw / Cl | Cw/Ci  | Wst. Den       | Infi   | X-well | Y. Well | X-well Y- Well Z-Well | 9-year Avg.  |    | 9-year Avg.       |      |
| at High End           | (m2)   | Ē        | (m3)     | (mg/L) | (mg/kg)          | (L/kg) | (g/cm3) (m/yr) | (m/yr) | (m)    | Ê       | (E)                   | Conc. (mg/L) |    | Rank Conc. (mg/L) | Rank |
| Base Case             | 60705  | _        | 133.92   | 0.75   | 51.9             | 69.20  | 1.4            | 0.17   | 430    | 117.75  | 6.5                   | 3.93E-03     |    | 8.70E-03          | L    |
| Xwell & Wst Vol       | 60705  |          | 1557.85  | 0.75   | 51.9             | 69.2   | 1.4            | 0.17   | 102    | 93.79   | 6.5                   | 2.49E-02     | 22 | 1.70E-01          | -    |
| Ywell & Wst. Vol      | 60705  |          | 1557.85  | 0.75   | 51.9             | 69.2   | 4.1            | 0.17   | 430    | 0.00    | 6.5                   | 4.98E-02     | 4  | 9.76E-02          | 2    |
| Infil & Wst. Vol      | 60705  | 2.6      | 1557.85  | 0.75   | 51.9             | - 69.2 | 1.4            | 0.46   | 430    | 117.75  | 6.5                   | 3.11E-02     | 18 | 8.67E-02          | 6    |
| TCLP & Wst. Vol       | 60705  | 2.6      | 1557.85  | 1.6    | 51.9             | 32.438 | 4.             | 0.17   | 430    | 117.75  | 6.5                   | 3.20E-02     | 16 | 7.71E-02          | 4    |
| Wst. Vol & Wst. Conc  | 60705  | 2.6      | 1557.85  | 0.75   | 110              | 146.67 | 4.             | 0.17   | 430    | 117.75  | 6.5                   | 1.15E-02     | 26 | 7.17E-02          | 2    |
| Xwell & Wst. Conc     | 60705  |          | 133.92   | 0.75   | 110              | 146.67 | 4.1            | 0.17   | 102    | 93.79   | 6.5                   | 2.53E-02     | 21 | 5.84E-02          | 6    |
| Area & Wst. Vol       | 420888 |          | 1557.85  | 0.75   | 51.9             | 69.2   | 1.4            | 0.17   | 430    | 238.82  | 6.5                   | 2.26E-01     | -  | 3.96E-02          | 1    |
| Exposure & Wst. Vol.  | 60705  | 2.6      | 1557.85  | 0.75   | 51.9             | 69.20  | 1.4            | 0.17   | 430    | 117.75  | 6.5                   | AN           | ¥  | 3.87E-02          | 8    |
| Ywell & Xwell         | 60705  | 2.6      | 133.92   | 0.75   | 51.9             | 69.20  | 4.4            | 0.17   | 102    | 0.00    | 6.5                   | 7.69E-02     | 9  | 3.22E-02          | 6    |
| Ywell & Wst Conc      | 60705  | 2.6      | 133.92   | 0.75   | 110              | 146.67 | 4.             | 0.17   | 430    | 0.00    | 6.5                   | 5.09E-02     | 5  | 3.12E-02          | 2    |
| TCLP & xwell          | 60705  | 2.6      | 133.92   | 1.6    | 51.9             | 32.44  | 4.1            | 0.17   | 102    | 93.79   | 6.5                   | 6.40E-02     | 9  | 3.02E-02          | =    |
| infil & Xwell         | 60705  | 2.6      | 133.92   | 0.75   | 51.9             | 69.20  | 4.7            | 0.46   | 102    | 93.79   | 6.5                   | 7.33E-02     | 7  | 2.86E-02          | 12   |
| Xwell & Zwell         | 60709  | 2.6      | 133.92   | 0.75   | 51.9             | 69.20  | 1.4            | 0.17   | 102    | 93.79   | 1.3                   | 3.65E-02     | 15 | 2.76E-02          | 13   |
| Wst. Vol & Zwell      | 60705  | 2.6      | 1557.85  | 0.75   | 51.9             | 69.20  | 1.4            | 0.17   | 430    | 117.75  | 1.3                   | 4.79E-03     | 82 | 2.71E-02          | 4    |
| Infil-& Wst. Conc     | 60705  | 2.6      | 133.92   | 0.75   | 110              | 146.67 | 1.4            | 0.46   | 430    | 117.75  | 6.5                   | 3.08E-02     | 19 | 2.06E-02          | 15   |
| TCLP & Wst Conc       | 60705  | 5.6      | 133.92   | 1.6    | 110              | 68.75  | 4.             | 0.17   | 430    | 117.75  | 6.5                   | 3.12E-02     | 12 | 1.85E-02          | 9    |
| Ywell & TCLP          | 60705  | 2.6      | 133.92   | 1.6    | 51.9             | 32.44  | 1.4            | 0.17   | 430    | 0.00    | 6.5                   | 1.23E-01     | 3  | 1.58E-02          | 11   |
| Ywell & Infil         | 60705  | 2.6      | 133.92   | 0.75   | 51.9             | 69.20  | 1.4            | 0.46   | 430    | 0.00    | 6.5                   | 1.15E-01     | 4  | 1.39E-02          | 18   |
| Exposure & X-well     | 60705  | 5.6      | 133.92   | 0.75   | 51.9             | 69.20  | 1.4            | 0.17   |        | 93.79   | 6.5                   | ΑΝ           | ž  | 1.30E-02          | 19   |
| INTER TOLP            | 60705  |          | 133.92   | 1.6    |                  | 32.44  | 1.4            | 0.46   |        | 117.75  | 6.5                   | 6.45E-02     | 6  | 9.91E-03          | 20   |
| Exposure & Wst. Conc. | 60705  | +        | 133.92   | 0.75   | $\neg$           | 146.67 | 1.4            | 0.17   |        | 117.75  | 6.5                   | NA           | ¥N | 9.39E-03          | 21   |
| Wst Conc & Zwell      | 60705  | 2.6      | 133.92   | 0.75   | 7                | 146.67 | 4.1            | 0.17   | -      | 117.75  | 1.3                   | 4.86E-03     | 22 | 8.75E-03          | 22   |
| Exposure & Y-well     | 60705  | 2.6      | 133.92   | 0.75   | 51.9             | 69.20  |                | 0.17   | 430    | 0.00    | 6.5                   | NA           | ž  | 7.93E-03          | 23   |
|                       | 60705  | 2.6      | 133.92   | 0.75   | 7                | 69.20  | 1.4            | 0.17   | _      | 0.00    | 1.3                   | 2.25E-02     | 23 | 7.73E-03          | 24   |
| Sono                  | 420888 | 2.6      | 133.92   | 0.75   | 1                | 146.67 | 1              | 0.17   | _      | 238.82  | 6.5                   | 1.25E-01     | 2  | 7.47E-03          | 25   |
|                       | 420888 | 1        | 133.92   | 0.75   | 1                | 69.20  | 4.             | 0.17   | -      | 217.62  | 6.5                   | 1.15E-01     | s  | 6.29E-03          | 56   |
| intil & Zwell         | 60705  | -+       | 133.92   | 0.75   | 7                | 69.20  |                | 0.46   |        | 117.75  | 1.3                   | 1.15E-02     | 25 | 4.69E-03          | 27   |
| 25                    | 60705  | {        | 133.92   | 9.1    | -                | 32.44  | 1.4            | 0.17   | 430    | 117.75  | 6.5                   | AN           | ž  | 4.48E-03          | 88   |
|                       | 60705  | -        | 133.92   | 1.6    |                  | 32.44  | 1.4            | 0.17   | 430    | 117.75  | 1.3                   | 1.18E-02     | 24 | 4.45E-03          | 82   |
| <u>=</u>              | 60705  | $\dashv$ | 133.92   | 0.75   | $\dashv$         | 69.20  | 1.4            | 0.46   |        | 117.75  | 6.5                   | AN<br>A      | ş  | 4.01E-03          | 8    |
|                       | 420888 | ┪        | 133.92   | 0.75   | 7                | 69.20  | 4.             | 0.17   |        | 0.00    | 6.5                   | 6.66E-02     | 8  | 3.67E-03          | 31   |
| 4                     | 420888 | -        | -        | 9.     | 7                | 32.44  | 7              | 0.17   | $\neg$ | 238.82  | 6.5                   | 6.35E-02     | 11 | 3.55E-03          | 32   |
|                       | 420888 | -        | -        | 0.75   | 7                | 69.20  | 1.4            | 0.46   | _      | 238.82  | 6.5                   | 5.46E-02     | 12 | 2.83E-03          | 33   |
| Z-well                | 60705  | +        | -        | 0.75   | ᅥ                | 69.20  | 4.4            | 0.17   |        | 117.75  | 1.3                   | NA           | ¥  | 2.21E-03          | ä    |
|                       | 420888 | -+       |          | 0.75   | $\dashv$         | 69.20  | 4.1            | 0.17   |        | 238.82  | 6.5                   | 2.61E-02     | 8  | 2.16E-03          | 35   |
| Exposure & Area (4    | 420888 | 96       | 133 92   | 75.0   | 640              | 0000   |                | -      |        |         |                       |              |    |                   |      |

Table B.7 Sensitivity Analysis for HF Alkylation Off-Site Landfill/Benzene - Industrial Landfills -- Including Exposure Duration as a Parameter

|                       |        |        | Wst   |               |        | J.               |        |        |        |                       |                | 4006     | ſ    | 4007       |      |
|-----------------------|--------|--------|-------|---------------|--------|------------------|--------|--------|--------|-----------------------|----------------|----------|------|------------|------|
| Two Parameters        | Area   | Depth  | Quant | Quant Wet Vol | 7CLP   | Wat Conc Cw / Cl | Cw/C   | nfil   | X-well | X-well Y- Well 7-Well | Z-Well         | 9-voar   |      | Outons Aug |      |
| at High End           | (m2)   | (m)    | (MT)  | (m3)          | (mg/L) | (mg/kg)          | (L/kg) | (m/yr) | Œ      | Œ                     | Œ              |          | Rank |            | Rank |
| Base Case             | 20200  | 2.6    | 28960 | 36813.6       | 9.00   | 4.3              | 56.58  | 0.17   | 430    | 85.91                 | 6.5            | 6.42E-04 |      | 4.00E-03   |      |
| Area & Xwell          | 162000 |        | 28960 |               | 0.076  | 4.3              | 56.58  | 0.17   | 102    | 142.35                | 6.5            | 2.30E-02 | 2    | 3.92E-02   | -    |
| Area & TCLP           | 162000 |        | 28960 | 36813.6       | 0.18   | 4.3              | 23.89  | 0.17   | 430    | 165.01                | 6.5            | 3.64E-02 | 2    | 3.78E-02   | 2    |
| infil & Xwell         | 20200  | 2.6    | 28960 | 28960 36813.6 | 0.076  | 4.3              | 56.58  | 0.46   | 102    | 92.09                 | 6.5            | 4.22E-03 | =    | 3.78E-02   | 3    |
| Area & Infil          | 162000 | 2.6    | 28960 |               | 0.076  | 4.3              | 56.58  | 0.46   | 430    | 165.01                | 6.5            | 3.98E-02 | -    | 3.19E-02   | 4    |
| TCLP & xwell          | 20200  | 2.6    | 28960 | 36813.6       | 0.18   | 4.3              | 23.89  | 0.17   | 102    | 60.76                 | 6.5            | 2.84E-03 | 55   | 3.17E-02   | 2    |
| Ywell & TCLP          | 20200  | 2.6    | 28960 | 36813.6       | 0.18   | 4.3              | 23.89  | 0.17   | 430    | 0.00                  | 6.5            | 6.82E-04 | 24   | 2.62E-02   | 9    |
| Area & Ywell          | 162000 | 2.6    | 28960 | 36813.6       | 0.076  | 4.3              | 56.58  | 0.17   | 430    | 0.00                  | 6.5            | 2.26E-02 | 9    | 2.33E-02   | 7    |
| Infil & TCLP          | 20200  | 2.6    | 28960 | 36813.6       | 0.18   | 4.3              | 23.89  | 0.46   | 430    | 85.91                 | 6.5            | 6.81E-03 | 80   | 2.28E-02   | 80   |
| Ywell & Infil         | 20200  | 2.6    | 28960 | 28960 36813.6 | 0.076  | 4.3              | 56.58  | 0.46   | 430    | 0.00                  | 6.5            | 1.27E-03 | 23   | 2.26E-02   | 6    |
| Area & Wst. Conc      | 162000 | 2.6    | 28960 | 28960 36813.6 | 0.076  | 14               | 184.21 | 0.17   | 430    | 165.01                | 6.5            | 3.02E-02 | က    | 2.12E-02   | 10   |
| Area & Wst. Vol       | 162000 | 5.6    |       |               | 920.0  | 4.3              | 56.58  | 0.17   | 430    | 165.01                | 6.5            | 2.43E-02 | 4    | 2.01E-02   | =    |
| Ywell & Xweii         | 20200  | 2.6    | 28960 | 36813.6       | 920.0  | 4.3              | 56.58  | 0.17   | 102    | 0.00                  | 6.5            | 2.79E-04 | 27   | 1.96E-02   | 12   |
| Exposure & Area       | 162000 | 5.6    | 28960 | 36813.6       | 9.00   | 4.3              | 56.58  | 0.17   | 430    | 165.01                | 6.5            | Ϋ́       | ₹    | 1.65E-02   | 13   |
| Xwell & Zwell         | 20200- | -      | 28960 | 36813.6       | 0.076  | 4.3              | 56.58  | 0.17   | 102    | 92.09                 | 1.3            | 1.42E-03 | 22   | 1.63E-02   | 4    |
| Xwell & Wst. Conc     | 20200  | _      |       |               | 0.076  | 14               | 184.21 | 0.17   | 102    | 60.76                 | 6.5            | 1.45E-03 | 21   | 1.36E-02   | 15   |
| Xwell & Wst Vol       | 20200  |        |       |               | 9.000  | 4.3              | 56.58  | 0.17   | 102    | 60.76                 | 6.5            | 1.48E-03 | 20   | 1.35E-02   | 16   |
| Ywell & Wst. Vol      | 20200  |        |       |               | 0.076  | 4.3              | 56.58  | 0.17   | 430    | 0.00                  | 6.5            | 6.11E-04 | 92   | 1.13E-02   | 17   |
| Ywell & Wst Conc      | 20200  | _      |       | _             | 9.00   | 14               | 184.21 | 0.17   | 430    | 0.00                  | 6.5            | 6.74E-04 | 52   | 1.07E-02   | 18   |
| Exposure & X-well     | 20200  | _      |       |               | 9.00   | 4.3              | 56.58  | 0.17   | 102    | 92:09                 | 6.5            | NA       | ¥    | 1.06E-02   | 19   |
| Inn & Wst. Conc       | 20200  | _      | 28960 |               | 9.00   | 44               | 184.21 | 0.46   | 430    | 85.91                 | 6.5            | 6.35E-03 | 6    | 1.04E-02   | 8    |
| Infil & Wst. Vol      | 20200  | $\neg$ |       |               | 0.076  | 4.3              | 56.58  | 0.46   | 430    | 85.91                 | 6.5            | 4.31E-03 | 9    | 1.03E-02   | 21   |
| Area & Zwell          | 162000 | _      |       |               | 9.076  | 4.3              | 56.58  | 0.17   |        | 165.01                | 6.5            | 8.69E-03 | -    | 9.90E-03   | 22   |
| TCLP & Wst. Vol       | 20200  | _      |       | 67371.3       | 0.18   | 4.3              | 23.89  | 0.17   | 430    | 85.91                 | 6.5            | 2.90E-03 | 4    | 9.32E-03   | 23   |
| ICLP & Wst Conc       | 20200  | ヿ      |       |               | 0.18   | 4                | 77.78  | 0.17   | 430    | 85.91                 | 6.5            | 3.18E-03 | 13   | 9.27E-03   | 24   |
| Exposure & Y-Well     | 20200  | $\neg$ |       |               | 0.076  | 4.3              | 56.58  | 0.17   | 430    | 0.00                  | 6.5            | NA       | ۸    | 8.78E-03   | 25   |
| Exposure & that       | 20200  | -1     |       |               | 0.076  | 4.3              | $\neg$ | 0.46   | 430    | 85.91                 | 6.5            | NA       | ΑA   | 8.01E-03   | 56   |
| Exposure & ICLP       | 20200  | _      |       |               | 0.18   | 4.3              |        | 0.17   | 430    | 85.91                 | 6.5            | NA       | ¥    | 7.23E-03   | 27   |
| rwell & zwell         | 20200  | 7      |       |               | 9.00   | 4.3              | -      | 0.12   | -      | 0.00                  | 1.3            | 2.73E-04 | 28   | 5.59E-03   | 78   |
| infil & Zwell         | 20200  | ⊣      | - 1   |               | 0.076  | 4.3              | 56.58  | 0.46   | -      | 85.91                 | <del>د</del> . | 3.88E-03 | 12   | 4.51E-03   | 59   |
| ICLP & Zwell          | 20200  | _      |       |               | 0.18   |                  | 23.89  | 0.17   | 430    | 85.91                 | 1.3            | 2.05E-03 | 19   | 4.39E-03   | 8    |
| Wst. Vol & Wst. Conc  | 20200  | -+     |       |               | 0.076  |                  | -      | 0.17   | -      | 85.91                 | 6.5            | 1.71E-03 | 82   | 3.99E-03   | 31   |
| Exposure & Wst. Conc. | 20200  | $\neg$ | 28960 |               | 0.076  |                  | -      | 0.17   | -      | 85.91                 | 6.5            | A<br>A   | ¥    | 3.83E-03   | 32   |
| Exposure & Wst. Vol.  | 20200  | _      |       |               | 9.00   | 4.3              | -      | 0.17   | -      | 85.91                 | 6.5            | NA       | Ϋ́   | 3.33E-03   | 33   |
| Wst. Vol & Zwell      | 20200  |        |       |               | 0.076  |                  |        | 0.17   | -      | 85.91                 | 1.3            | 1.54E-03 | 19   | 1.90E-03   | 34   |
| Wst Conc & Zwell      | 20200  | -      |       | 1             | 0.076  | $\neg$           | -      | 0.17   | -      | 85.91                 | 1.3            | 1.74E-03 | 12   | 1.80E-03   | 35   |
| Exposure & Z-well     | 20200  | 2.6    | 28960 | 36813.6       | 9.00   | 4.3              | 56.58  | 0.17   | 430    | 85.91                 | 1.3            | ΑĀ       | ΑĀ   | 1.48E-03   | 36   |
|                       |        |        |       |               |        | ,                |        |        |        |                       |                |          |      |            |      |

Table B.8 'Sensitivity Analysis for HF Alkylation Off-Site Landfill/Benzene - Municipal Landfills - Including Exposure Duration as a Parameter

|                       |        |        |                               | -       |                     |          | i      |        |                               |               | _1                          |      |                           |      |
|-----------------------|--------|--------|-------------------------------|---------|---------------------|----------|--------|--------|-------------------------------|---------------|-----------------------------|------|---------------------------|------|
| at High End           | (m2)   | (m)    | WSC. Vol. TCLP<br>(m3) (mg/L) | (mg/L)  | Wat Conc<br>(mg/kg) | Cw/Cl    | (m/yr) | X-well | X-well Y- Well Z-Well (m) (m) | Z-Well<br>(m) | 9-year Avg.<br>Conc. (mg/L) | Rank | 9-year Avg.<br>Well Conc. | Rank |
| Base Case             | 60705  | 2.6    | 36813.6                       | 0.076   | 4.3                 | 56.58    | 0.17   | 85     | 117.75                        | _             | 6.42E-04                    |      |                           | L    |
| TCLP & xwell          | 60705  | 2.6    | 36813.6                       | 0.18    | 4.3                 | 23.89    | 0.17   | 102    | 93.79                         | 6.5           | 2.84E-03                    | 15   | 6.36E-02                  | -    |
| Infil & Xwell         | 60705  | 2.6    | 36813.6                       | 0.076   | 4.3                 | 56.58    | 0.46   | 102    | 93.79                         | 6.5           | 4.22E-03                    | Ξ    | 5.44E-02                  | 7    |
| Infil & TCLP          | 60705  | 2.6    | 36813.6                       | 0.18    | 4.3                 | 23.89    | 0.46   | 430    | 117.75                        | 6.5           | 6.81E-03                    | 80   | 4.62E-02                  | 6    |
| Area & TCLP           | 420888 | 2.6    | 36813.6                       | 0.18    | 4.3                 | 23.89    | 0.17   | 430    | 238.82                        | 6.5           | 3.64E-02                    | 2    | 3.90E-02                  | 4    |
| Area & Xweli          | 420888 | 2.6    | 36813.6                       | 0.076   | 4.3                 | 56.58    | 0.17   | 102    | 217.62                        | 6.5           | 2.30E-02                    | 2    | 3.90E-02                  | 2    |
| Ywell & TCLP          | 60709  | 2.6    | 36813.6                       | 0.18    | 4.3                 | 23.89    | 0.17   | 430    | 0.00                          | 6.5           | 6.82E-04                    | 24   | 3.87E-02                  | 9    |
| Ywell & Xwell         | 60209  | 2.6    | 36813.6                       | 0.076   | 4.3                 | 56.58    | 0.17   | 102    | 0.00                          | 6.5           | 2.79E-04                    | 27   | 3.15E-02                  | -    |
| Ywell & Infil         | 60705  | 2.6    | 36813.6                       | 0.076   | 4.3                 | 56.58    | 0.46   | 430    | 0.00                          | 6.5           | 1.27E-03                    | 23   | 3.11E-02                  | 80   |
| Kwell & Wst. Conc     | 60705  | 2.6    | 36813.6                       | 0.076   | 4                   | 184.21   | 0.17   | 102    | 93.79                         | 6.5           | 1.45E-03                    | 21   | 3.00E-02                  | 6    |
| Area & Wst. Conc      | 420888 | 2.6    | 36813.6                       | 0.076   | 4                   | 184.21   | 0.17   | 430    | 238.82                        | 6.5           | 3.02E-02                    | 6    | 2.95E-02                  | 2    |
| Xwell & Wst Vol       | 60709  | 2.6    | 57371.3                       | 0.076   | 4.3                 | 56.58    | 0.17   | 102    | 93.79                         | 6.5           | 1.48E-03                    | 8    | 2.89E-02                  | =    |
| Area & Infil          | 420888 | 5.6    | 36813.6                       | 9.000   | 4.3                 | 56.58    | 0.46   | 430    | 238.82                        | 6.5           | 3.98E-02                    | -    | 2.76E-02                  | 12   |
| Xwell & Zwell         | 60705  |        | 36813.6                       | 9.000   | 4.3                 | 56.58    | 0.17   | 102    | 93.79                         | 1.3           | 1.42E-03                    | 22   | 2.63E-02                  | 13   |
| Area & Wst. Vol       | 420888 | 5.6    | 57371.3                       | 0.076   | 4.3                 | 56.58    | 0.17   | 430    | 238.82                        | 6.5           | 2.43E-02                    | 4    | 2.59E-02                  | 4    |
| Infil & Wst. Conc     | 60709  | 5.6    | 36813.6                       | 0.076   | 14                  | 184.21   | 0.46   | 430    | 117.75                        | 6.5           | 6.35E-03                    | 6    | 2.44E-02                  | 15   |
| Area & Ywell          | 420888 | 2.6    | 36813.6                       | 920.0   | 4.3                 | 56.58    | 0.17   | 430    | 0.00                          | 6.5           | 2.26E-02                    | 9    | 2.41E-02                  | 16   |
| TCLP & Wst Conc       | 60705  | 5.6    | 36813.6                       | 0.18    | 14                  | 77.78    | 0.17   | 430    | 117.75                        | 6.5           | 3.18E-03                    | 13   | 2.39E-02                  | 4    |
| Infil & Wst. Vol      | 60705  | 2.6    | 57371.3                       | 0.076   | 4.3                 | 56.58    | 0.46   | 430    | 117.75                        | 6.5           | 4.31E-03                    | 5    | 2.36E-02                  | 8    |
| Exposure & X-well     | 60705  | 5.6    | 36813.6                       | 0.076   | 4.3                 | 56.58    | 0.17   | 102    | 93.79                         | 6.5           | ΑĀ                          | ž    | 2.35E-02                  | 19   |
| TCLP & Wst. Vol       | 60705  | 2.6    | 57371.3                       | 0.18    | 4.3                 | 23.89    | 0.17   | 430    | 117.75                        | 6.5           | 2.90E-03                    | 4    | 2.26E-02                  | 20   |
| Exposure & Area       | 420888 | 5.6    | 36813.6                       | 0.076   | 4.3                 | 56.58    | 0.17   | 430    | 238.82                        | 6.5           | ΑN                          | ¥    | 1.90E-02                  | 21   |
| Exposure & TCLP       | 60705  | 2.6    |                               | 0.18    | 4.3                 | 23.89    | 0.17   | 430    | 117.75                        | 6.5           | ΑN                          | ž    | 1.87E-02                  | 22   |
| Ywell & Wst Conc      | 60705  | 5.6    |                               | 0.076   | 14                  | 184.21   | 0.17   | 430    | 0.00                          | 6.5           | 6.74E-04                    | 52   | 1.84E-02                  | 23   |
| Ywell & Wst. Vol      | 60705  |        |                               | 0.076   | 4.3                 | -        | 0.17   | 430    | 0.00                          | 6.5           | 6.11E-04                    | 56   | 1.80E-02                  | 24   |
| Exposure & Infil      | 60705  |        |                               | 9.00    | 4.3                 | $\vdash$ | 0.46   |        | 117.75                        | 6.5           | A.                          | ž    | 1.73E-02                  | 52   |
| Exposure & Y-well     | 60705  |        | {                             | 9.00    | 4.3                 | 56.58    | 0.17   |        | 0.00                          | 6.5           | NA                          | ΑĀ   | 1.45E-02                  | 56   |
| Area & Zwell          | 420888 |        |                               | 0.076   | 4.3                 | $\vdash$ | 0.17   |        | 238.82                        | 6.5           | 8.69E-03                    | _    | 1.40E-02                  | 27   |
| TCLP & Zwell          | 60709  |        |                               | 0.18    | 4.3                 | -        | 0.17   | 430    | 117.75                        | 1.3           | 2.05E-03                    | 16   | 1.07E-02                  | 28   |
| infil & Zwell         | 60709  | -      |                               | 9.00    | 4.3                 | $\vdash$ | 0.46   |        | 117.75                        | 1.3           | 3.88E-03                    | 12   | 1.05E-02                  | 29   |
| Wst. Vol & Wst. Conc  | 60709  |        |                               | 0.076   | 14                  | -        | 0.17   | -      | 117.75                        | 6.5           | 1.71E-03                    | 200  | 1.03E-02                  | 30   |
| Ywell & Zwell         | 60709  | -      |                               | 0.076   | 4.3                 | —        | 0.17   | 430    | 0.00                          | 1.3           | 2.73E-04                    | 28   | 8.67E-03                  | 31   |
| Exposure & Wst. Conc. | 60709  |        |                               | 9.00    | 14                  |          | 0.17   | 430    | 117.75                        | 6.5           | Ą                           | ₹    | 8.03E-03                  | 32   |
| Exposure & Wst. Vol.  | 60709  | -      |                               | 0.076   | 4.3                 | -        | 0.17   | 430    | 117.75                        | 6.5           | AN                          | ₹    | 8.02E-03                  | 83   |
| Wst Conc & Zwell      | 60709  | $\neg$ | 36813.6                       | 0.076   | 14                  | -        | 0.17   | 430    | 117.75                        | 1.3           | 1.74E-03                    | 17   | 5.07E-03                  | 8    |
| Wst. Vol & Zwell      | 60705  | _      | 67371.3                       | -0.076- | 4.3                 | -        | 0.17   | _      | 117.75                        | 1.3           | 1.54E-03                    | 19   | 4.96E-03                  | 35   |
| Exposure & 7-well     | 8070E  | 90     | 0.07000                       | 010     |                     |          |        |        |                               | ֡             |                             |      |                           |      |

## APPENDIX C DETERMINISTIC DAF'S

Table C.1 Comparison of DAFs for the Two High-End Parameter Analysis (20-year Waste Voumes, Industrial Landfills)

|   |                   |       | NODA         |        |       | 1998             |       |
|---|-------------------|-------|--------------|--------|-------|------------------|-------|
|   | _                 |       | May 0 year A |        |       |                  |       |
| Waste Stream                                  | Constituent       | 10    | Moll O       |        |       | Max. 9-year Avg. |       |
| CSO shipped                                   |                   |       | well conc.   | DAF    | TCLP  | Well Conc.       | DAF * |
| afonic >>>                                    | Benzene           | 0.059 | 1.55E-02     | 3.8    | 0.050 | 4 505 00         |       |
| Contingent CSO Sludge                         | Benzene           | 0.050 | 1 667 00     |        | 9.00  | 1.32E-UZ         | 3.9   |
| Carde Oil tack Jack in object                 |                   | 0.000 | Z0-300-1     | , X    | 0.059 | 1.50E-02         | 3.9   |
| dain seuillen                                 | Benzene           | 0.679 | 1.71E-01     | 4.0    | 0.870 | 7.77             |       |
| Hydrotreating Catalyst                        | Benzene           | 7.0   | Local        | 2      | 6.0.0 | 1.5/E-U1         | 4.3   |
|   |                   | B     | 3.38⊏-01     | 23.4   | 7.9   | 6.02E-01         | 13.1  |
|   | Arsenic           | 7:    | 2.11E-02     | 52.3   | -     | 1,00             |       |
| Off-spec products and fines (1 param)         | Renzia            | 1 3 3 |              | 2      | -     | 2.24E-02         | 49.0  |
|   | zenz(a)anniacene  | 0.013 | 9.29E-05     | 139.9  | 0.013 | 2 11E 04         | 0.70  |
| Off-spec products and fines (2-param) Benz(a) | Benz(a)anthracene | 0.013 | 3 855 04     | 1000   |       | 2.115-04         | 01.8  |
| Hydrorefining catalyst                        | 0                 |       | 0.00E-04     | 33.8   | 0.013 | 6.39E-04         | 20.3  |
| 10 (mm) 6                                     | Denzene           | 1.49  | 2.26E-01     | 9.9    | 1.49  | 3 10 = .01       | 1.7   |
|   | Arsenic           | 13.71 | 2 DAE-04     | 67.0   |       |                  | +     |
| Unleaded gasoline tank sediment               |                   |       | 2.071.01     | 2.70   | 13.71 | 1.77E-01         | 77.5  |
|   | penzene           | 0.75  | √×           | Α<br>V | 0.75  | 0 045 00         |       |
| HFalkylation sludge                           | Benzene           | 0.00  |              |        | 2     | 3.34E-UZ         | 7.5   |
|   |                   | 0.0/0 | 3.98E-02     | 6.1    | 0.076 | 3.73E-02         | 2.0   |
|   |                   |       |              |        | -     | !                | į     |

<sup>\*</sup> DAF = leachate concentration (TCLP)/Well Conc.

Table C.2 Comparison of DAFs for the Two High-End Parameter Analysis (20-year Waste Voumes, Municipal Landfills)

|  |                   |       | NODA             |       |       | 1998             |       |
|--|-------------------|-------|------------------|-------|-------|------------------|-------|
|  |                   |       | Max. 9-year Avg. |       |       | Max. 9-year Avg. |       |
| Waste Stream                                 | Constituent       | TCLP  | Well Conc.       | DAF * | TCLP  | Well Conc.       | DAF * |
| CSO sludge                                   | Benzene           | 0.059 | 1.55E-02         | 3.8   | 0.059 | 2.15E-02         | 2.8   |
| Contingent CSO Sludge                        | Benzene           | 0.059 | 1.55E-02         | 3.8   | 0.059 | 2.15E-02         | 2.8   |
| Crude Oil tank sediment                      | Benzene           | 0.679 | 1.71E-01         | 4.0   | 0.679 | 2.38E-01         | 2.9   |
| Hydrotreating Catalyst                       | Benzene           | 7.9   | 3.38E-01         | 23.4  | 7.9   | 5.73E-01         | 13.8  |
|  | Arsenic           | 1.1   | 2.11E-02         | 52.3  | 1.1   | 1.66E-02         | 66.1  |
| Off-spec products and fines (1 param)        | Benz(a)anthracene | 0.013 | 9.29E-05         | 139.9 | 0.013 | 1.39E-04         | 93.7  |
| Off-spec products and fines (2-param) Benz(a | Benz(a)anthracene | 0.013 | 3.85E-04         | 33.8  | 0.013 | 6.96E-04         | 18.7  |
| Hydrorefining catalyst                       | Benzene           | 1.49  | 2.26E-01         | 6.6   | 1.49  | 4.20E-01         | 3.6   |
|  | Arsenic           | 13.71 | 2.04E-01         | 67.2  | 13.71 | 1.18E-01         | 116.0 |
| Unleaded gasoline tank sediment              | Benzene           | 0.75  | N/A              | N/A   | 0.75  | 1.41E-01         | 5.3   |
| HFalkylation sludge                          | Benzene           | 0.076 | 3.98E-02         | 1.9   | 0.18  | 6.06E-02         | 3.0   |

DAF = leachate concentration (TCLP)/Well Conc.

Table C.3 Comparison of DAFs for the Two High-End Parameter Analysis (30-year Waste Voumes, Industrial Landfills)

|   |                   |       | NODA             |       |       | 1998             |        |
|---|-------------------|-------|------------------|-------|-------|------------------|--------|
|   |                   | -     | Max. 9-year Avg. |       |       | Max. 9-year Avg. |        |
| Waste Stream  | Constituent       | TCLP  | Well Conc.       | DAF * | TCLP  | Well Conc.       | DAF *  |
| CSO sludge  | Benzene           | 0.059 | 1.55E-02         | 3.8   | 0.059 | 1.82E-02         | 3.2    |
| Contingent CSO Sludge                                   | Benzene           | 0.059 | 1.55E-02         | 3.8   | 0.059 | 1.78E-02         | 2 8    |
| Crude Oil tank sediment                                 | Benzene           | 0.679 | 1.71E-01         | 4.0   | 0.679 | 1915-01          | 2 %    |
| Hydrotreating Catalyst                                  | Benzene           | 39    | 3.38E-01         | 115.5 | 7.9   | 7.41E-01         | 10.7   |
|   | Arsenic           | 1.1   | 2.11E-02         | 52.3  | 1.1   | 3.23E-02         | 34.0   |
| Off-spec products and fines (1 param)                   | Benz(a)anthracene | 0.013 | 9.29E-05         | 139.9 | 0.013 | 2 915-04         | 7 7 7  |
| Off-spec products and fines (2-param) Benz(a)anthracene | Benz(a)anthracene | 0.013 | 3.85E-04         | 33.8  | 0.013 | 7 02E-04         | 18 7   |
| Hydrorefining catalyst                                  | Benzene           | 1.49  | 2.26E-01         | 6.6   | 1.49  | 3.93E-01         | 2.5    |
|   | Arsenic           | 13.71 | 2.04E-01         | 67.2  | 13.71 | 2.61E-01         | 52.6   |
| Unleaded gasoline tank sediment                         | Benzene           | 0.75  | N/A              | A'N   | 0.75  | 1.08E-01         | 0 9    |
| HFalkylation sludge                                     | Benzene           | 0.076 | 3.98E-02         | 1.9   | 0.076 | 3.92E-02         | 1.9    |
|   |                   |       |                  | -     |       |                  | -<br>: |

<sup>\*</sup> DAF = leachate concentration (TCLP)/Well Conc.

Table C.4 Comparison of DAFs for the Two High-End Parameter Analysis (30-year Waste Voumes, Municipal Landfills)

|   |                   |       | •                |       |          |                  |        |
|---|-------------------|-------|------------------|-------|----------|------------------|--------|
|   |                   |       | NODA             |       |          | 1998             |        |
| - ;                                     |                   |       | Max. 9-year Avg. |       |          | Max. 9-year Avg. |        |
| Waste Stream                            | Constituent       | TCLP  | Well Conc.       | DAF * | TCLP     | Well Conc.       | א שאט  |
| CSO sludge                              | Benzene           | 0.059 | 1.55E-02         | 3.8   | 0.059    | 2.21E-02         | 2 6    |
| Contingent CSO Sludge                   | Benzene           | 0.059 | 1.55E-02         | 3.8   | 0.059    | 2 21E 02         | 7 7    |
| Crude Oil tank sediment                 | Benzene           | 0.670 | 4 745 04         |       |          | 2.41.70          | 7.7    |
| Hydrotroctics Octabies                  |                   | 200   | 1.7.15.0.1       | 4.O   | 0.6/9    | 2.39E-01         | 5.8    |
| nydrotreating Catalyst                  | Benzene           | 83    | 3.38E-01         | 275.5 | 7.9      | 7.97E-01         | 9.9    |
|   | Arsenic           | 4.    | 2.11E-02         | 52.3  | 1.1      | 2 41F-02         | 45.6   |
| Off-spec products and fines (1 param)   | Benz(a)anthracene | 0.013 | 9 29F-05         | 130 0 | 0.043    | 10 1100 0        | 0.5    |
| Off-snec products and fine ()           |                   |       |                  | 2.00. | 20.0     | Z.U3E-U4         | 04.0   |
| כיי | penz(a)antnracene | 0.013 | 3.85E-04         | 33.8  | 0.013    | 8.56E-04 ·       | 15.2   |
| Hydrorefining catalyst                  | Benzene           | 1.49  | 2.26E-01         | 9.9   | 1.49     | 4.59E-01         | 3.2    |
|   | Arsenic           | 13.71 | 2 04F-01         | 67.2  | 13 74    | 4 777 04         | 3.     |
| Interpolation design                    |                   |       |                  | 7:10  |          | 10-0//-          | . (.7) |
| Sincado gasoline tank sediment          | penzene           | 0.75  | N/A              | ΥX    | 0.75     | 1.70E-01         | 4.4    |
| HFalkylation sludge                     | Benzene           | 0.076 | 3.98E-02         | 1.9   | 0.18     | 6.36E-02         | 3 6    |
|   |                   |       |                  |       | <u>-</u> | 0.005-04         | 7.0    |

<sup>\*</sup> DAF = leachate concentration (TCLP)/Well Conc.

1.17

Table C.5 Comparison of DAFs for the Central Tendency Scenario (20-yr Waste Volume, Industrial Landfills)

|                                       |                   |       | 1000             |        |       |                  |        |
|---------------------------------------|-------------------|-------|------------------|--------|-------|------------------|--------|
|                                       |                   | ,     | NODA             |        |       | 1997             |        |
|                                       |                   |       | Max. 9-year Avg. |        |       | Max. 9-year Avg. |        |
| Waste Stream                          | Constituent       | TCLP  | Well Conc.       | DAF *  | TCLP  | Well Conc.       | DAF *  |
| CSO sludge                            | Benzene           | 0.059 | 4.78E-04         | 123.4  | 0.059 | 2.00E-03         | 29.5   |
| Contingent CSO Sludge                 | Benzene           | 0.059 | 4.77E-04         | 123.7  | 0.059 | 1.96E-03         | 30.1   |
| Crude Oil Tank Sludge                 | Benzene           | 0.679 | 5.12E-03         | 132.6  | 0.679 | 2.11E-02         | 32.2   |
| Hydrotreating Catalyst                | Benzene           | 7.9   | 3.96E-02         | 199.5  | 7.9   | 4.99E-02         | 158.3  |
|                                       | Arsenic           | 1.1   | 1.92E-03         | 572.9  | 1.1   | 1.23E-03         | 894.3  |
| Off-spec products and fines (1 param) | Benz(a)anthracene | 0.013 | 4.16E-06         | 3125.0 | 0.013 | . 1.02E-05       | 1274.5 |
| Off-spec products and fines (2-param) | Benz(a)anthracene | 0.013 | 4.16E-06         | 3125.0 | 0.013 | 1.02E-05         | 1274.5 |
| Hydrorefining catalyst                | Benzene           | 1.49  | 3.93E-03         | 379.1  | 1.49  | 4.35E-02         | 34.3   |
|                                       | Arsenic           | 13.71 | 1.17E-02         | 1171.8 | 13.71 | 6.82E-03         | 2010.3 |
| Unleaded gasoline tank sludge         | Benzene           | 0.75  | N/A              | N/A    | 0.75  | 6.69E-03         | 112.1  |
| HFalkylation sludge                   | Benzene           | 0.076 | 6.42E-04         | 118.4  | 0.076 | 4.00E-03         | 19.0   |
|                                       |                   |       |                  |        |       |                  | -      |

<sup>\*</sup> DAF = leachate concentration (TCLP)/Well Conc.

Table C.6 Comparison of DAFs for the Central Tendency Scenario (20-yr Waste Volume, Municipal Landfills)

|   |                   |       | AGOM             |        |       |                  |         |
|---|-------------------|-------|------------------|--------|-------|------------------|---------|
|   |                   |       | NODA             |        |       | 1997             |         |
|   |                   |       | Max. 9-year Avg. |        |       | Max. 9-year Avg. |         |
| waste Stream  | Constituent       | TCLP  | Well Conc.       | DAF *  | TCLP  | Well Conc        | * 1140  |
| CSO sludge  | Benzene           | 0.059 | 4.78E-04         | 123.4  | 0.059 | 2 QOE 03         | 1       |
| Contingent CSO Sludge                                   | Benzene           | 0.059 | 4.77E-04         | 123.7  | 0.050 | 2.30E-03         | 20.3    |
| Crude Oil Tank Sludge                                   | Bonzono           | 0.00  |                  |        | 0.00  | 4.79E-U3         | 21.1    |
| 0.65  | Pelizelle         | 0.679 | 5.12E-03         | 132.6  | 0.679 | 2.93E-02         | 23.2    |
| Hydrotreating Catalyst                                  | Benzene           | 6.7   | 3.96E-02         | 199.5  | 7.9   | 4.26E-02         | 185.4   |
|   | Arsenic           |       | 1 92F-03         | 5720   | *     | 4 000 00         |         |
|   |                   |       |                  | 0.4.0  | -     | 1.09E-U3         | 1009.2  |
| on spec products and lines (1 param)                    | Benz(a)anthracene | 0.013 | 4.16E-06         | 3125.0 | 0.013 | 1 01F-05         | 1287 1  |
| Off-spec products and fines (2-param) Benz(a)anthracene | Benz(a)anthracene | 0.013 | 4.16E-06         | 3125.0 | 0.013 | 4 045 05         | 1.007.1 |
| Hydrorefining catalyst                                  | Benzene           | 1.49  | 3 93E-03         | 370.4  | 2 4   | 1.01E-03         | 1787.1  |
|   |                   |       | 2001             | 0.9.   | 24.   | 5.80E-02         | 25.7    |
|   | Arsenic           | 13.71 | 1.17E-02         | 1171.8 | 13.71 | 5.50F-03         | 7 0070  |
| Unleaded gasoline tank sludge                           | Benzene           | 0.75  | N/A              | A/A    | 0.75  | F 06E 03         | 4000    |
| HFalkylation sludge                                     |                   |       |                  |        | 2     | J.00E-U3         | 128.0   |
|   | penzene           | 0.076 | 6.42E-04         | 118.4  | 0.18  | 9.65E-03         | 18.7    |
|   |                   |       |                  |        |       |                  | :       |

<sup>\*</sup> DAF = leachate concentration (TCLP)/Well Conc.

Table C.7 Comparison of DAFs for the Central Tendency Scenario (30-yr Waste Volume, Industrial Landfills)

|   |                   |       | NODA             | ×      |       | 1997             |        |
|---|-------------------|-------|------------------|--------|-------|------------------|--------|
| 3   | e de magneta      |       | Max. 9-year Avg. |        |       | Max. 9-year Avg. |        |
| Waste Stream  | Constituent       | TCLP  | Well Conc.       | DAF *  | TCLP  | Well Conc        | * 44   |
| CSO sludge  | Benzene           | 0.059 | 4.78E-04         | 123.4  | 0.059 | 2 27E-03         | 0 90   |
| Contingent CSO Sludge                                   | Benzene           | 0.059 | 4.77E-04         | 123.7  | 0.059 | 2.21E.03         | 20.0   |
| Crude Oil Tank Sludge                                   | Benzene           | 0.679 | 5.12E-03         | 1326   | 0.679 | 2 425 02         | 20.0   |
| Hydrotreating Catalyst                                  | Benzene           | 7.9   | 3.96E-02         | 199.5  | 6 2   | 7 19E 02         | 400.0  |
|   | Arsenic           | 1.1   | 1 92E-03         | 572.0  | 7     | 4 047 00         | 109.9  |
|   |                   |       | ייטבר סס         | 512.3  |       | 1.84E-U3         | 597.8  |
| Oil-spec products and lines (1 param)                   | Benz(a)anthracene | 0.013 | 4.16E-06         | 3125.0 | 0.013 | 1.31E-05         | 992 4  |
| Off-spec products and fines (2-param) Benz(a)anthracene | Benz(a)anthracene | 0.013 | 4.16E-06         | 3125.0 | 0.013 | 1 31E-05         | 000 4  |
| Hydrorefining catalyst                                  | Benzene           | 1.49  | 3.93E-03         | 379.1  | 1 49  | 5 07E-02         | 20.4   |
|   | Arsenic           | 13.71 | 1.17E-02         | 11718  | 13.71 | 1 025 02         | 4544   |
| Unleaded gasoline tank sludge                           | Benzene           | 0.75  | N/A              | N/A    | 0.75  | 0.405.02         | 1344.1 |
| HFalkylation sludge                                     | Benzene           | 920.0 | 6 47E 04         |        | 2 3   | 3.40E-U3         | /8.8   |
|   | 2002              | 0.0.0 | 0.42E-04         | 118.4  | 9/0.0 | 4.00E-03         | 19.0   |

<sup>\*</sup> DAF = leachate concentration (TCLP)/Well Conc.

Table C.8 Comparison of DAFs for the Central Tendency Scenario (30-yr Waste Volume, Municipal Landfills)

|                                    |                   |       | 1017             |  |            |                  |        |
|------------------------------------|-------------------|-------|------------------|--|------------|------------------|--------|
|                                    |                   |       | NODA             |  |            | 1997             |        |
| Waste Stream                       |                   |       | Max. 9-year Avg. |  |            | May 0 year A     |        |
|                                    | Constituent       | TCLP  | Well Conc.       | א שעט                                  | Č          | man. 3-year Avg. |        |
| CSO sludge                         | Benzene           | 0.00  |                  | 3                                      | בן<br>הרו  | Well Conc.       | DAF *  |
| Contingent Co.                     |                   | 8co.0 | 4.78E-04         | 123.4                                  | 0.059      | 2 745 00         |        |
| Schringent CSO Sindge              | Benzene           | 0.059 | A 77E 04         |  |            | 3.74E-U3         | 15.8   |
| Crude Oil Tank Sludne              | 0                 |       | 7.77E-04         | 123.7                                  | 0.028      | 3.64E-03         | 16.2   |
|                                    | penzene           | 0.679 | 5 12E_03         | 7.000                                  |            |                  | 7.5.   |
| Hydrotreating Catalyst             | Renzene           |       | 2.141.00         | 132.0                                  | 0.679      | 3.80E-02         | 17.9   |
|                                    |                   | 6./   | 3.96E-02         | 199.5                                  | 7.0        | 0 200            |        |
|                                    | Arsenic           | 4.4   | 20 100 7         |  | 5:         | 0.30E-UZ         | 124.2  |
| Off-spec products and 6-12         |                   | -     | 1.9ZE-03         | 572.9                                  | <u>-</u> - | 1 64F.03         | 1010   |
| er of products and lines (1 param) | Benz(a)anthracene | 0.013 | 4 40 1 00        |  | -          | 20 310           | 7.070  |
| Off-spec products and face /2      |                   | 2123  | 4.105-06         | 3125.0                                 | 0.013      | 1.42F-05         | 045    |
| (z-param) Benz(a)anthracene        | Benz(a)anthracene | 0.013 | 4 16E 08         | 24010                                  |            | 20.11            | 910.0  |
| Hydrorefining catalyst             | Benzene           | 4     | 4.102-00         | 3125.0                                 | 0.013      | 1.42E-05         | 915.5  |
|                                    |                   | 1.40  | 3.93E-03         | 379.1                                  | 1.49       | 7 63F-02         | 7 04   |
|                                    | Arsenic           | 13.71 | 1 17 00          | †<br>                                  | 1          | 1.00L VE         | 9.5    |
| Unleaded gasoline tank sludge      | Benzana           |       | 1.11E-02         | 11/1.8                                 | 13.71      | 8.24E-03         | 1663.8 |
|                                    |                   | 0.75  | -<br>∀X          | ×××××××××××××××××××××××××××××××××××××× | 0.75       | 0 705 0          |        |
| rir alkylation sludge              | Benzene           | 0.076 | R 42E 04         |  | 2          | 8./UE-03         | 86.2   |
|                                    | T                 | ,,    | 0.42E-04         | 118.4                                  | 0.18       | 9 9 1 1 0 3      | 9      |

\* DAF = leachate concentration (TCLP)/Well Conc.

## APPENDIX D MONTE CARLO RECEPTOR WELL CONCENTRATIONS

Table D.1 Summary of Receptor Well Concentrations for 1998 Monte Carlo Analyses (30 Year Waste Volumes, Municipal Landfill Areas, Receptor Well Anywhere)

| HBN Total Stituent (mg/L) 6.23E-03 6.23E-03 6.23E-03 7.00E-04 Inthracene 4.00E-04 6.23E-03 3.00E-04 6.23E-03 6.23E-03 6.23E-03 6.23E-03 6.23E-03  | tituent          | 50-th<br>percentile<br>Well Conc.<br>(mg/l) | 90-th<br>percentile  | 95-th                | 98-th                | 4 <del>1</del> -66   |
|---|------------------|---|----------------------|----------------------|----------------------|----------------------|
| Constituent         HBN           Constituent         (mg/L)           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Arsenic         3.00E-04           Benz(a)anthracene         4.00E-04           Benz(a)anthracene         4.00E-04           Benzene         6.23E-03           Arsenic         3.00E-04           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03 | tituent          | percentile<br>Well Conc.<br>(mg/l)          | percentile           | nercentile           | norcontilo           | 1                    |
| Constituent         (mg/L)           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Arsenic         3.00E-04           Benz(a)anthracene         4.00E-04           Benzene         6.23E-03           Menzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03  | tituent          | (mg/l)                                      | :                    |                      | beinganad            | percentile           |
| Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Arsenic         3.00E-04           Benz (a) anthracene         4.00E-04           Benz (a) anthracene         4.00E-04           Benzene         6.23E-03           ment         Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03   |                  | 2 445 07                                    | Well Conc.<br>(mg/l) | Well Conc.<br>(mg/l) | Well Conc.<br>(mg/l) | Well Conc.<br>(mg/l) |
| Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Arsenic         3.00E-04           Benz(a)anthracene         4.00E-04           Benzene         6.23E-03           Arsenic         3.00E-04           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03  |                  | 3.445-07                                    | 5.31E-03             | 1.12E-02             | 2.0E-02              | 2.55E-02             |
| Benzene         6.23E-03           Benzene         6.23E-03           Arsenic         3.00E-04           Benz(a)anthracene         4.00E-04           Benz(a)anthracene         4.00E-04           Benzene         6.23E-03           Arsenic         3.00E-04           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03   |                  | 9.47E-08                                    | 2.58E-03             | 6.38E-03             | 1.4E-02              | 1.95E-02             |
| Benzene         6.23E-03           Arsenic         3.00E-04           Benz(a)anthracene         4.00E-04           Benz(a)anthracene         4.00E-04           Benzene         6.23E-03           Menzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03  |                  | 2.73E-07                                    | 1.13E-02             | 4.47E-02             | 1.4E-01              | 2.28E-01             |
| Arsenic 3.00E-04  Benz(a)anthracene 4.00E-04  Benz(a)anthracene 4.00E-04  Benzene 6.23E-03  Arsenic 3.00E-04  ment Benzene 6.23E-03  Benzene 6.23E-03  Benzene 6.23E-03   |                  | 1.13E-07                                    | 1.44E-02             | 6.90E-02             | 3.1E-01              | 7.62E-01             |
| 2         Benz(a)anthracene         4.00E-04           3         Benz(a)anthracene         4.00E-04           Benzene         6.23E-03           Arsenic         3.00E-04           ment         Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03   |                  | 2.04E-13                                    | 8.73E-04             | 3.45E-03             | 9.9E-03              | 1.92E-02             |
| 3         Benz(a)anthracene         4.00E-04           Benzene         6.23E-03           Arsenic         3.00E-04           ment         Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03  |                  | 0.00E+00                                    | 1.42E-05             | 1.36E-04             | 7.7E-04              | 1.77E-03             |
| Benzene         6.23E-03           Arsenic         3.00E-04           ment         Benzene         6.23E-03           Benzene         6.23E-03  |                  | 0.00E+00                                    | 1.29E-05             | 1.10E-04             | 6.2E-04              | 1.13E-03             |
| Arsenic         3.00E-04           ment         Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03  |                  | 3.94E-07                                    | 1.87E-02             | 4.91E-02             | 2.1E-01              | 5.15E-01             |
| ment         Benzene         6.23E-03           Benzene         6.23E-03           Benzene         6.23E-03   |                  | 1.08E-09                                    | 1.16E-02             | 4.38E-02             | 2.0E-01              | 4.73E-01             |
| Benzene 6.23E-03 Benzene 6.23E-03   | Benzene          | 1.76E-09                                    | 2.64E-03             | 1.17E-02             | 5.1E-02              | 1.12E-01             |
| Benzene 6.23E-03  |                  | 1.20E-07                                    | 3.97E-03             | 9.58E-03             | 1.9E-02              | 2.73E-02             |
|   | Benzene 6.23E-03 | 6.30E-10                                    | 1,81E-03             | 7.55E-03             | 2.7E-02              | 6.22E-02             |
| Arsenic 3.00E-04 1.18   | -                | 1.18E-23                                    | 5.77E-05             | 2.53E-04             | 9.2E-04              | 1.97E-03             |
| Co-disposal without H/Cracking Benzene 6.23E-03 5.00  |                  | 5.00E-10                                    | 1.58E-03             | 6.83E-03             | 2.6E-02              | 5.32E-02             |
| Arsenic 3.00E-04 1.32   | =                | 1.32E-23                                    | 6.02E-05             | 2.64E-04             | 9.4E-04              | 1.81E-03             |

For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.

The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis.

The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis.

Table D.2 Summary of Receptor Well Concentrations for 1998 Monte Carlo Analyses (30 Year Waste Volumes, Municipal Landfill Areas, Receptor Well within Plume)

| -                               |                   |              | 50-th                    | 90-th                    | 95-th                    | 98-th                    | 99-th                    |
|---------------------------------|-------------------|--------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ,                               |                   | HBN<br>Total | percentile<br>Well Conc. |
| Waste Stream                    | Constituent       | (mg/L)       | (I/6m)                   | (mg/l)                   | (mg/l)                   | (I/gm)                   | (mg/l)                   |
| CSO sludge                      | Benzene           | 6.23E-03     | 3.10E-04                 | 7.96E-03                 | 1.35E-02                 | 2.03E-02                 | 2.53E-02                 |
| Contingent CSO Sludge           | Benzene           | 6.23E-03     | 2.11E-04                 | 5.20E-03                 | 9.36E-03                 | 1.56E-02                 | 2.11E-02                 |
| Crude Oil tank sediment         | Benzene           | 6.23E-03     | 6.01E-04                 | 3.47E-02                 | 8.81E-02                 | 0.2076                   | 3.26E-01                 |
| Hydrotreating Catalyst 1        | Benzene           | 6.23E-03     | 9.43E-04                 | 6.63E-02                 | 2.04E-01                 | 0.6707                   | 1.29E+00                 |
|                                 | Arsenic           | 3.00E-04     | 3.84E-05                 | 2.79E-03                 | 6.88E-03                 | 1.64E-02                 | 2.68E-02                 |
| Off-spec products and fines 2   | Benz(a)anthracene | 4.00E-04     | 2.99E-08                 | 1.21E-04                 | 4.33E-04                 | 1.53E-03                 | 2.72E-03                 |
| Off-spec products and fines 3   | Benz(a)anthracene | 4.00E-04     | 2.35E-08                 | 9.46E-05                 | 3.40E-04                 | 9.75E-04                 | 1.74E-03                 |
| Hydrorefining catalyst 1        | Benzene           | 6.23E-03     | 1.31E-03                 | 4.49E-02                 | 0.1107                   | 2866.0                   | 6.48E-01                 |
| ;                               | Arsenic           | 3.00E-04     | 5.14E-04                 | 3.57E-02                 | 1.09E-01                 | 0.3118                   | 5.76E-01                 |
| Unleaded gasoline tank sediment | Benzene           | 6.23E-03     | 1.85E-04                 | 1.24E-02                 | 3.52E-02                 | 0.09226                  | 1.54E-01                 |
| HFalkylation sludge             | Benzene           | 6.23E-03     | 2.89E-04                 | 7.72E-03                 | 1.30E-02                 | 2.35E-02                 | 3.40E-02                 |
| Co-disposal with H/Cracking     | Benzene           | 6.23E-03     | 9.24E-05                 | 6.48E-03                 | 1.71E-02                 | 4.97E-02                 | 9.70E-02                 |
|                                 | Arsenic           | 3.00E-04     | 1.16E-06                 | 2.25E-04                 | 6.19E-04                 | 1.87E-03                 | 4.09E-03                 |
| Co-disposal without H/Cracking  | Benzene           | 6.23E-03     | 8.25E-05                 | 5.41E-03                 | 1.36E-02                 | 3.73E-02                 | 6.83E-02                 |
|                                 | Arsenic           | 3.00E-04     | 1.23E-06                 | 2.34E-04                 | 6.05E-04                 | 1.96E-03                 | 3.89E-03                 |

For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.

The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis.
 The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analys

The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis.

Table D.3 Summary of Receptor Well Concentrations for 1998 TC Capped Monte Carlo Analyses (30 Ýear Waste Volumes, Municipal Landfill Areas, Receptor Well Anywhere)

|   |                   |           |   |                                   |   | 1010111                           |                     |
|---|-------------------|-----------|---|-----------------------------------|---|-----------------------------------|---------------------|
| Waste Stream                              | Constituent       | HBN Total | percentile | 90-th<br>percentile<br>Well Conc. | 90-th 95-th percentile percentile Well Conc. Well Conc. | 98-th<br>percentile<br>Well Conc. | 99-th<br>percentile |
| CSO sludge                                | Benzene           | 6.23F-03  | (I/Bill)  | (mg/l)                            | (mg/l)  | (mg/l)                            | (mg/l)              |
| Contingent CSO Studge                     | Benzene           | A 23E 03  | £ :   | ¥                                 | ¥.  | ¥                                 | ≨                   |
| Crude Oil tank sediment                   | Benzene           | 0.505-03  | ₹<br>Z  | ¥                                 | ¥   | ¥                                 | AN                  |
| Hydrotreating Catalyst 1                  | Bonzone           | 0.23E-03  | 4.68E-08  | 7.85E-03                          | 3.21E-02  | 8 55 00                           |                     |
| •   | Aligaile          | 6.23E-03  | 1.73E-08  | 8.91E-03                          | 3.35F-02  | 0.05-02                           | 0.1247              |
|   | Arsenic           | 3.00E-04  | S N   |                                   | 70  | 0.3E-UZ                           | 0.1397              |
| Off-spec products and fines 2             | Benz(a)anthracene | 1 200 2   | 5   | ¥                                 | ¥   | ₹                                 | ₹N                  |
| Off-spec products and fines 3             | all accine        | 4.00E-04  | A<br>A  | ¥                                 | AN  |                                   |                     |
| Hydroxee                                  | Denz(a)anthracene | 4.00E-04  | AM  | 414                               |   | ₹.                                | ₹<br>Z              |
| yororemining catalyst 1                   | Benzene           | 6 23E 03  | 1 2 2 2   | Ę                                 | Υ<br>Y  | ¥                                 | ¥                   |
|   | Arabai.           | 0.23E-03  | 3.51E-07  | 1.53E-02                          | 3.88E-02  | 7 SE 00                           | 1000                |
|   | Arsenic           | 3.00E-04  | 1 245 00  | ╀                                 |   | 1.3E-02                           | 0.1167              |
| Unleaded gasoline tank sediment   Benzene | Benzene           |           | -   | 1.11E-02                          | 4.12E-02  | 1.8E-01                           | 0.3870              |
| HFalkylation studie                       |                   | b.23E-03  | 2.03E-09   ;  | 2.45E-03                          | 1 025 03  | +                                 | 2000                |
| )   | genzene           | 6.23E-03  | ΑN  | +                                 | 20-10-  | 4.3E-02                           | 8.11E-02            |
| Co-disposal with H/Cracking               | Benzene           | 6 23E 02  |   | <u> </u>                          | ≨   | ₹                                 | ¥                   |
|   | Arsenic           | 20.505    | ¥.  | ¥                                 | AN  | Ą                                 | V.V                 |
| Co-disposal without Higher                |                   | 3.00E-04  | A<br>A  | A N                               | ΔN  |                                   | 5                   |
| T   | Benzene           | 6.23E-03  | ¥   | NA NA                             | <u> </u>  | ¥.                                | ≨                   |
|   | -                 | 3.00E-04  | NA.   | ٢                                 | ≨   | ≨                                 | ₹<br>¥              |
| 1. For hydrotreating and hydroteficing    |                   |           | 5   |                                   | _   | AN                                |                     |

For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste,

The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis.
 The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis.

NA: Not applicable because TCLP values were below the TC Rule level or because TC values are not available for the constituent, or not available because analysis not performed for this waste scenaric

Table D.4 Summary of Receptor Well Concentrations for 1998 TC Capped Monte Carlo Analyses

|                                |                   | Capped Municipal Landfill Areas, Recentor Moll. | Landfill Are                      | 38. Recentor                      | of Monte Carlo Analyses | Carlo Anal           | /ses                |
|--------------------------------|-------------------|---|-----------------------------------|-----------------------------------|-------------------------|----------------------|---------------------|
|                                |                   | -   |                                   |                                   | Light Within            | Plume)               |                     |
| Waste Stream                   | Constituent       | HBN Total                                       | 50-th<br>percentile<br>Well Conc. | 90-th<br>percentile<br>Well Conc. | 95-th<br>percentile     | 98-th<br>Percentile  | 99-th<br>Percentile |
| Contingent Co. C.              | Benzene           | 6.23E-03  | (mg/l)                            | (mg/l)                            | (mg/l)                  | Well Conc.<br>(mg/l) | Well Conc.          |
| Crude Oil tank goding          | Benzene           | 6.23E-03  | 5 5                               | ¥                                 | AA<br>A                 | ¥                    | NAN                 |
| Hydrotreating Catal            | Benzene           | 6.23E-03  | F 1                               | ¥                                 | Ā                       | ¥                    |                     |
| iig catalyst i                 | Benzene           | 6.23E-03  | 6.4E.04                           | 2.34E-02                          | 5.43E-02                | 1.16-01              | 1 525 04            |
|                                | Arsenic           | 3.00E-04  | 1                                 | 2.41E-02                          | 5.52E-02                | 1.1E-01              | 1 535 04            |
| Off spec products and fines 2  | Benz(a)anthracene | <del> </del>                                    | ¥.                                | ¥                                 | NA<br>A                 | \$                   | -30E-01             |
| Spec products and fines 3      | Benz(a)anthracene | $\perp$   | AN N                              | NA.                               | AN                      |                      | ¥                   |
| Hydrorefining catalyst 1       | Benzene           | 4.00E-04  | NA                                | Ā                                 | N. A.                   | ¥                    | ¥                   |
|                                | Pilotion          | 6.23E-03  | 1.1E-03                           | 2 8GE 00                          | ¥.                      | ¥                    | ¥                   |
| Unleaded dasoline tank         | Arsenic           | 3.00E-04  | 5 1F.04                           | 2.005-02                          | 5.23E-02                | 9.8E-02              | 1.43F.01            |
| HFalkylation studies           | ImentBenzene      | 6.23E-03  | 5 2 4                             | 3.20E-02                          | 9.55E-02                | 2.6E-01              | 4 355 04            |
|                                | Benzene           | 6 23E 03  |                                   | 9.32E-03                          | 2.44E-02                | +                    | 10-10-0             |
| Co-disposal with H/Cracking    | Benzene           | 0.252   | NA                                | NA                                | +                       | +                    | 8.65E-02            |
|                                | Areanic           | b.23E-03  | NA                                | Ą                                 |                         | ₹.                   | NA<br>NA            |
| Co-disposal without H/Cracking | Benzen            | 3.00E-04  | ¥                                 | ¥                                 | £ 5                     | ¥.                   | NA<br>A             |
|                                | The said          | 6.23E-03  | AN<br>AN                          | MA                                | £ .                     | NA<br>A              | ≨                   |
| 7                              | Visenic           | 3.00E-04  |                                   | 4                                 | Z<br>∀                  | ¥                    | 1                   |
|                                |                   | -   | AN                                | :                                 |                         |                      | AM                  |

 The TCLP conc. was estimated and was assumed to represent mean or expected TCLP value and non-detect values of 0.05 mg/l were included in the analysis.
 The TCLP conc. was estimated and assumed to represent maximum or high-end TCLP value and non-detect values of 0.05 mg/l were excluded from the analysis. For hydrotreating and hydrorefining, all waste quantities, except those managed in Subtitle C landfills, were modeled including reclaimed waste.

NA: Not applicable because TCLP values were below the TC Rule level or because TC values are not available for the constituent, or not available because analysis not performed for this waste scenario.